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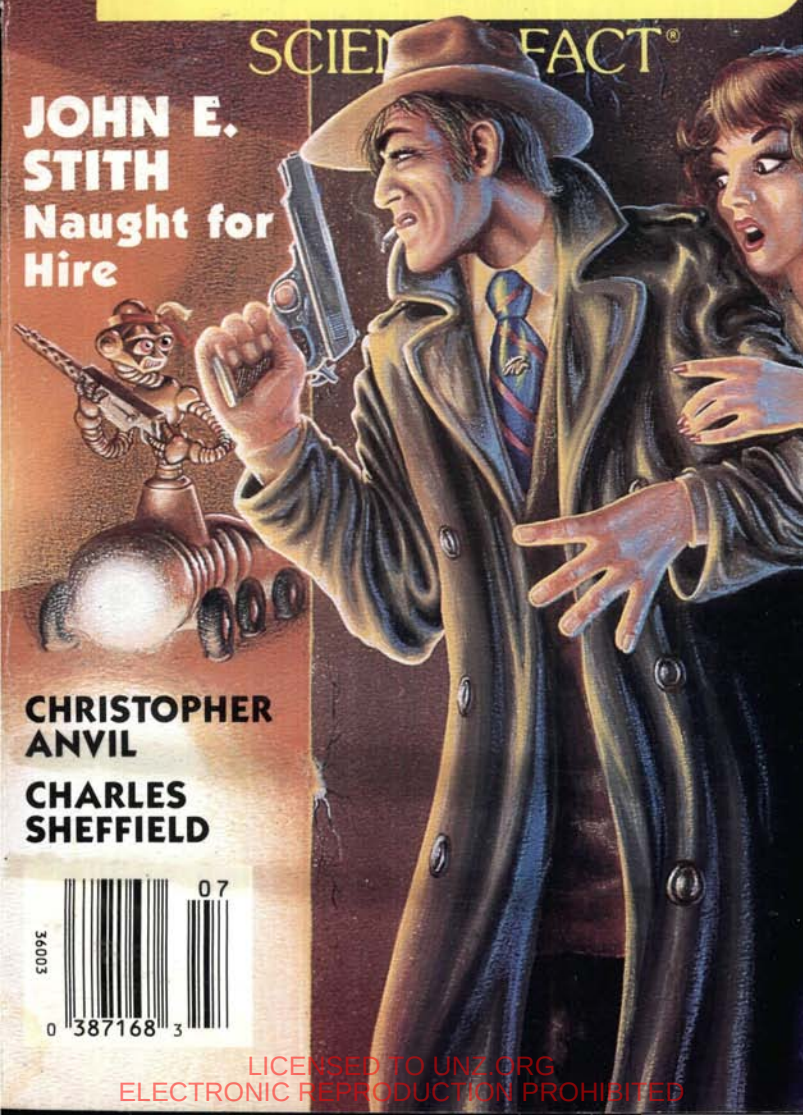

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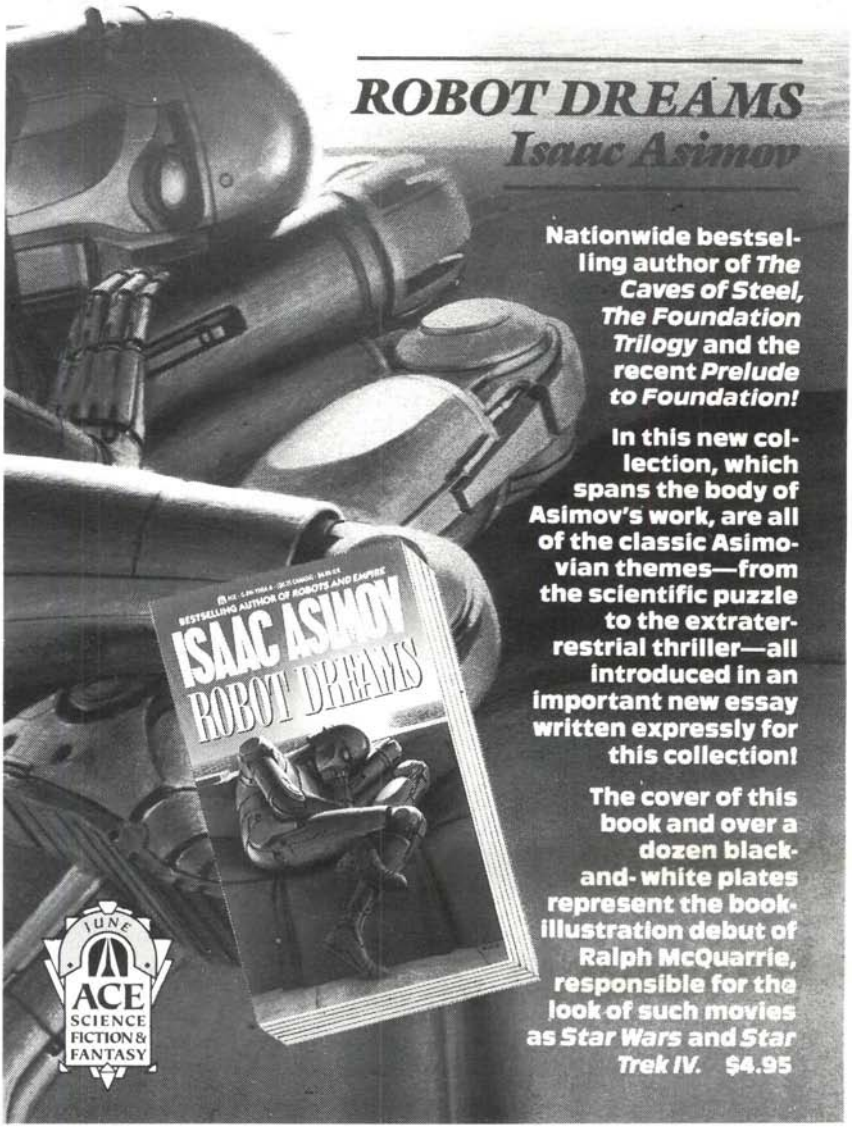
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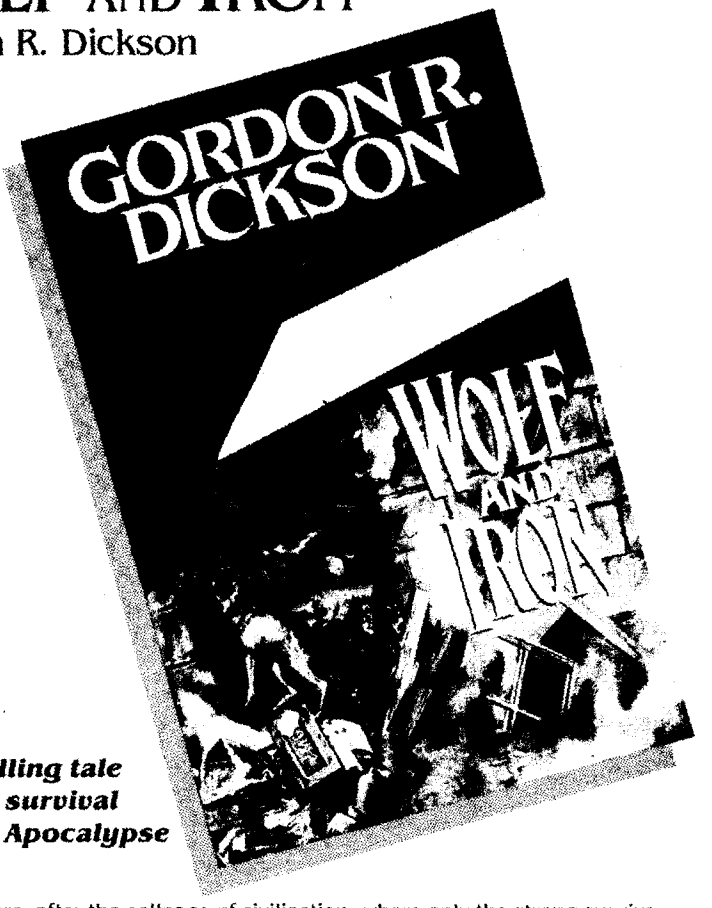

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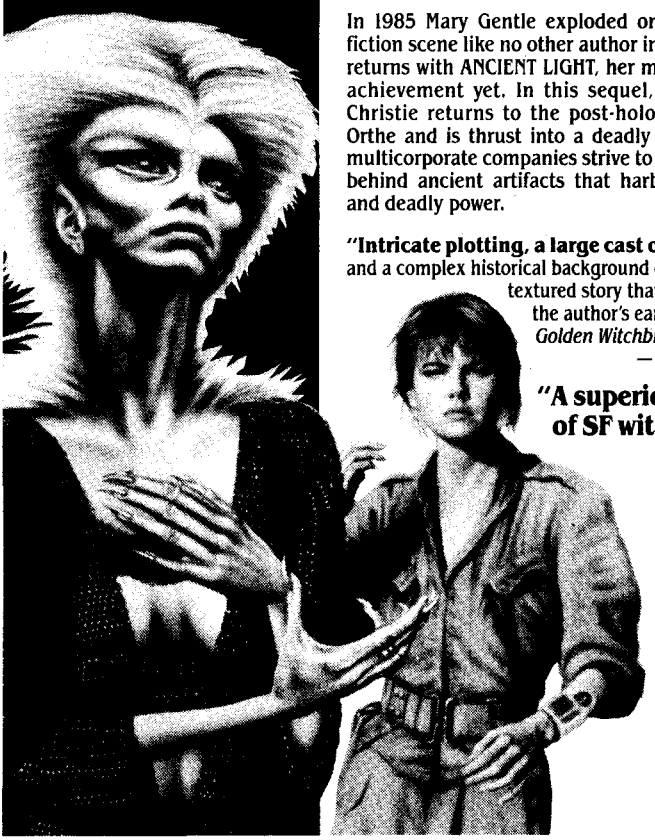

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Editorial

THE RIGHT TO BE WRONG

Stanley Schmidt

Magazines that deal in fact and opinion frequently get letters from readers who disagree with something they've published. This disagreement may be a clear case of writer and reader having different opinions on a point of judgment, or it may involve the reader's pointing out errors of fact he thinks the writer has made. These may be errors of commission or errors of omission: either the author has said something *wrong*, or he's failed to mention information which does not support his position.

Interestingly, there often seems to be an inverse correlation between the objecting reader's confidence and his correctness. The more loudly and emphatically a reader protests that the author is all wet, the more likely it is that the reader himself is mistaken. The reader who starts out almost apologetically, with lots of qualifications and an acknowledgment that he may be overlooking something, is often the one whose objections have real merit. Furthermore, when it comes to supporting opinions with facts, readers who accuse authors of mentioning only data that support their own position tend to be just as selective in defending their objections.

However, sometimes authors do make mistakes and readers do make valid objections to them. My question of the month is: what kinds of objections are valid, and how far should an editor go in trying to answer them and make sure that similar ones don't arise in the future?

The answer, in brief and oversimplified form, is that it depends on the nature of the piece in which the error occurred. In *Analog*, for example, we have science fact articles, in which we make every effort within our (less than infinite) power to be factually accurate; and we have columns (such as editorials, "The Alternate View," and "The Reference Library") in which the same

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writers regularly report recent developments and express opinions. The distinction is important. Opinion should normally be minimized in fact articles, and should be clearly identified when it is necessary to include it. In columns, opinion is understood to be a *major* part of the content.

And the standards that can and should be applied to fact and opinion pieces are necessarily different, for both practical and ethical reasons.

I recall a case where a column expressed opinions on some environmental issues which, quite predictably, drew a flood of heated letters from people who either agreed or disagreed with them. Few of those letters gave detailed or exhaustive arguments for their positions, much less sources for the claims they made, but a small number did. One, in particular (unfortunately much too long to print in our letter column), made several points that warranted serious consideration and cited specific research sources that the author seemed to have overlooked. It also suggested emphatically that in the future such columns be checked meticulously and not allowed to go to press with errors, or to express a viewpoint that seems wrong to most rational people.

The corrections and references were gratefully received. The author of *anything* should take into account as much relevant data as he can, and the last I heard the author of the offending piece was seeking out the sources cited by the letter writer. But I couldn't disagree more with the last recommendation. The correspondent was saying, in effect, that a news-and-opinion column should be subjected to the same standards as a fact article for a scholarly journal. I say that it can't and it shouldn't. Fact and opinion pieces are so essentially different that they must be written, edited, and read in quite different ways. (This requires, of course, that authors, editors, and readers must all be conscious of which they are dealing with at any time.)

But, you may object, opinions are *about* facts. Shouldn't an opinion columnist make sure that any facts he refers to are right? When, if ever, is it acceptable to be wrong?

When I was studying to become a physicist, one of my teachers remarked that a good physicist has to be someone who is willing to be wrong 90% of the time. He wasn't encouraging deliberate sloppiness; he simply meant that real science commonly involves trying a lot of wrong approaches before the right one is found. A successful scientist must not be unduly discouraged by that fact, or he may not be able to persevere long enough to find the right answer. He is likely to be wrong a large percentage of the time *in spite of his best efforts to be right*.

Such efforts *should* be made, as a matter of course, by scientists, opinion columnists, or anybody else. But the amount and kind of effort that can or should be made is different for different kinds of work. Part of the reason is purely logistical, as you can see from a comparison of how and why three different types of articles deal with scientific subjects.

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The people who are actually doing the research in a field communicate with each other through professional journals, highly specialized periodicals that go into great technical detail and are closely scrutinized for accuracy. They should be; the journal descriptions of today's research will form the basis for tomorrow's. Such articles, before being accepted for publication, are reviewed not only by an editor, but by at least a couple of "referees"—other workers in the same or closely related fields. It's not a *perfect* system; having been both a referee and an author of refereed papers, I can assure you that referees don't always catch everything, or even agree with each other about the same paper. But they do help. Having several highly knowledgeable sets of eyes scrutinize the same paper at least reduces the likelihood of publishing blatant nonsense. Of course, it also slows down the publication process (which isn't very fast to begin with, in most cases), so the few workers most actively involved in a field

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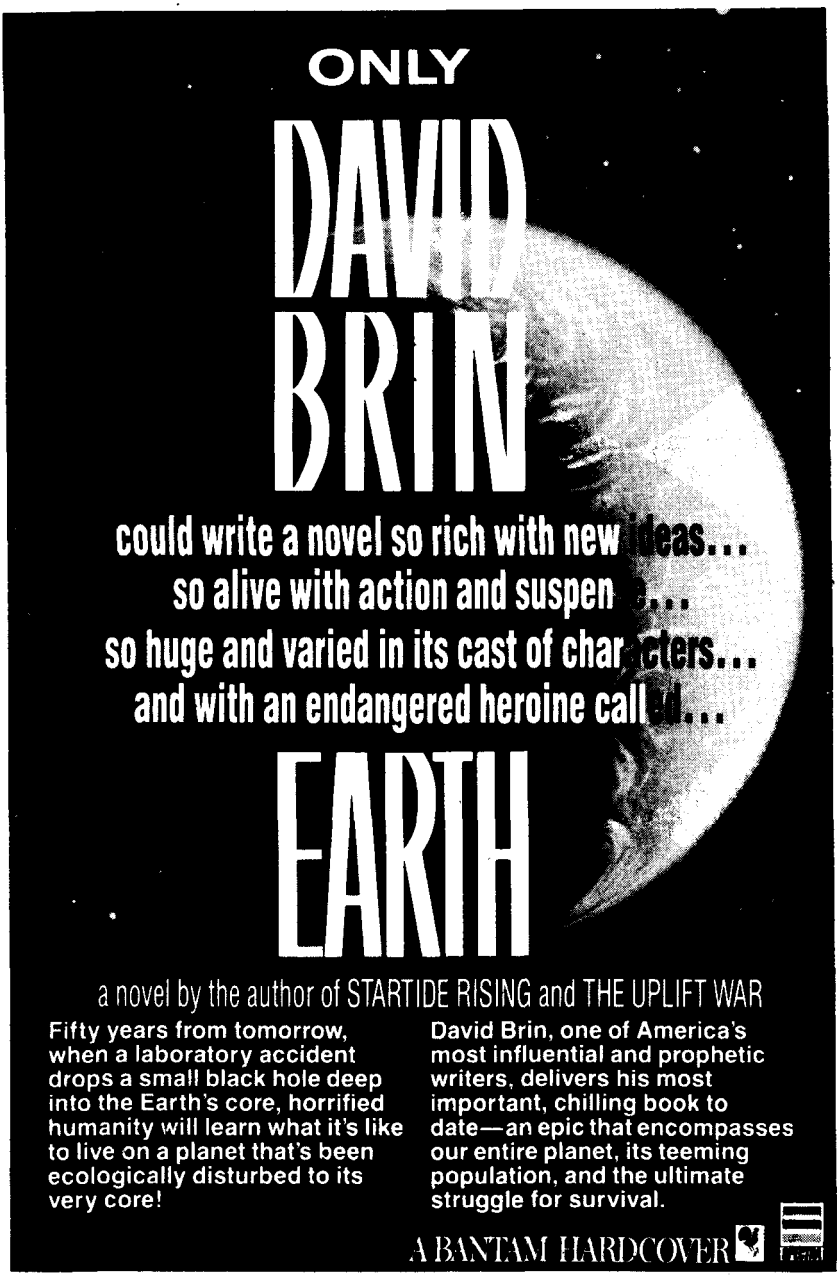

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commonly send each other "preprints": copies of the manuscript, straight from the typewriter into the mailbox.

It would be nice to be able to do that with every fact article in magazines for more general circulation, like *Analog*, but it isn't feasible. We do try to be quite careful; such articles often go back for several rounds of revision for scientific as well as literary reasons. It's no coincidence that most of the editors here have been scientifically trained: part of the job is catching scientific errors in both stories and articles. I can do this very comfortably in some fields and fairly well in others; and when I have doubts about something in a field I'm not intimately familiar with, I often know someone I can consult who *is* intimately familiar with it.

But I can't do that lightly, or too often, and routine refereeing of the intensity used by scholarly journals is out of the question. Referees are active researchers, and quite busy with their own work. They make time to referee an occasional journal article, on a volunteer basis, because they see it as a duty to the profession. Few would feel such a duty to a commercial magazine—and even if they were willing to provide such service for hire, few such magazines could afford to pay for it for every article they publish. Moreover, the constraints of staff size and strict deadlines sometimes make it impossible for even the best-informed and best-intentioned editorial staffs to pursue every question as far as they would like. Despite all these limitations, well-chosen and conscientious editors and authors can maintain quite high standards of accuracy in such "semi-popular" coverage. The differences from journal articles, as far as safeguards are concerned, are more of degree than of kind.

But regular columns, such as book or movie reviews or our "Alternate View," *are* different in kind. For one thing, nobody has ever claimed that their content is entirely factual. They are openly advertised as *reporting and commentary*, which means that (a) their factual content is likely to be quite new and still controversial, and (b) they also include varying amounts of personal opinion. For another—and this is more important than you might think—they are precommitted to regular publication, on a predetermined schedule, by a predetermined author.

This implies, among other things, that the option of leisurely checking and repeated revision to get everything just right *does not exist* for such columns. This is unfortunate, in some ways, but it comes with the territory. If you commit yourself to delivering a column by a particular author every month, and you want its content to be as timely as the publication schedule permits, then each of those columns will normally be delivered quite close to its deadline. If there are things obviously questionable about it, you will do what you can about them in the very limited time available. But you *will* publish it, on schedule, unless you have an *awfully* special reason not to.

All of this makes it practically inevitable that such columns are more likely to contain errors of fact or judgment

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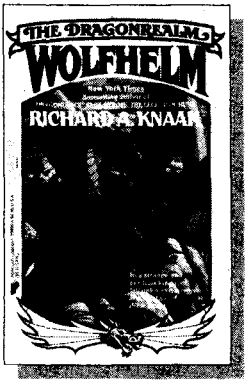

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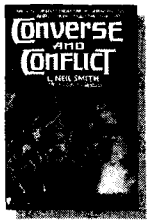

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A WORD FROM Brian Thomsen

When the wolf's at the door my first thought is always *escape*.

Okay, sometimes the wolf is only an irate copy chief (yes, I know my column is overdue) or an angry production coordinator (honest, I'll transmit the manuscript to you on Monday) or an extremely tolerant spouse (who did you say we were seeing for dinner?).

No death threats, just the demands of a normal day... and trips to the "Dragonrealm" make a normal day that much easier to take.

When you see me around, ask me about December 7, 1941.

Arigato.

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than fact articles, either here or in research journals. Readers need to understand that fact and adjust their reading style accordingly. (However, no one should be lulled into believing that even refereed journal articles are infallible!) Given these limitations, why should anyone publish such columns at all? Because readers have made it clear that they like them, for the particular functions that they can fulfill and the more rigorous types of articles cannot. Readers *want* information about very recent developments, even if it doesn't have all the bugs out of it yet, and they are interested in what some people think about such information. Columnists are given space on a regular basis, and an unusually free hand in how to use it, because they have information sources and/or opinions that enough readers have found worth reading, enough of the time, to want to continue doing so. Intelligent readers do not expect them to be "right" all the time; much of their value lies in the perception that they often say things *worth thinking about*. As somebody once said, "Sometimes it's more important to be stimulating than to be right."

This is not to minimize the importance of *trying* to be right—but it does lead to me to one final observation about the *other* reason for keeping editorial interference with columns to a minimum. Sometimes it would be *possible* to demand more changes in a column before publication, but I deliberately resist the temptation to do so because we *need* a few places where people *can* say things that might be outrageously wrong. Refereeing may reduce the chances of publishing blatant error, but it also tends to ensure orthodoxy. Big breakthroughs, almost by definition, are likely to come from people who challenge orthodoxy in a big way. While the letter I mentioned above contained much that merited serious consideration, I was very disturbed by its suggestion that I should not allow columnists to express "a viewpoint that seems wrong to most rational people."

Not many decades ago, the concept of plate tectonics seemed wrong to most rational people. Today it's the most important single concept in geology. Should it have been kept buried forever because it was unpopular when it was new?

That's only one example; it would be easy to list many others. We don't know yet which ideas are just now beginning a similar evolution. But *Analog* has long prided itself on being a place where a wide range of ideas, including very unorthodox ones, *can* be discussed and explored freely. That's one of the functions of the columns—including the letter column, in which readers can argue back. I think it's an *important* function, so *Analog* will continue to operate that way, no matter how irate —sometimes even justifiably so—a reader may occasionally become. Naturally any columnist who blunders too blatantly, too often, will be replaced. But as long as his overall performance justifies keeping him in his slot, I will normally insist on changes only when he says something either legally actionable or as clearly wrong as 2 + 2 = 5. Matters of public policy, and even some fields

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of ongoing research on complicated subjects like the environment, are not yet anywhere near that clear-cut.

However, while I as editor may recognize a "right to be wrong" in an occasional discussion of opinions, all of us—even columnists—would do well to remember that Nature does *not* recognize a right to be wrong. Some errors carry much more serious penalties than others; but whatever the penalty is, it will be dealt out quite impartially to anyone who makes the error. No exceptions. So it's worth every possible effort to develop as accurate an understanding as possible of How Things Work. A columnist who says something wrong may be doing us a favor by stimulating thought—but the value of the wrong lies only in its function as a bridge to a better understanding of "right." ■

SPECIAL NOTICE TO READERS

Beginning in 1990, we will be adding double issues to *Analog*'s schedule. Presently, the magazine is available every four weeks, or thirteen times a year.

The next anniversary issue will be virtually twice the size of a standard one, with even more of our stimulating stories and fact articles. A second special issue will be published approximately six issues later.

Our first double issue premiered with the January 1990 60th Anniversary. The next double issue will be in January 1991, followed by a double issue in July.

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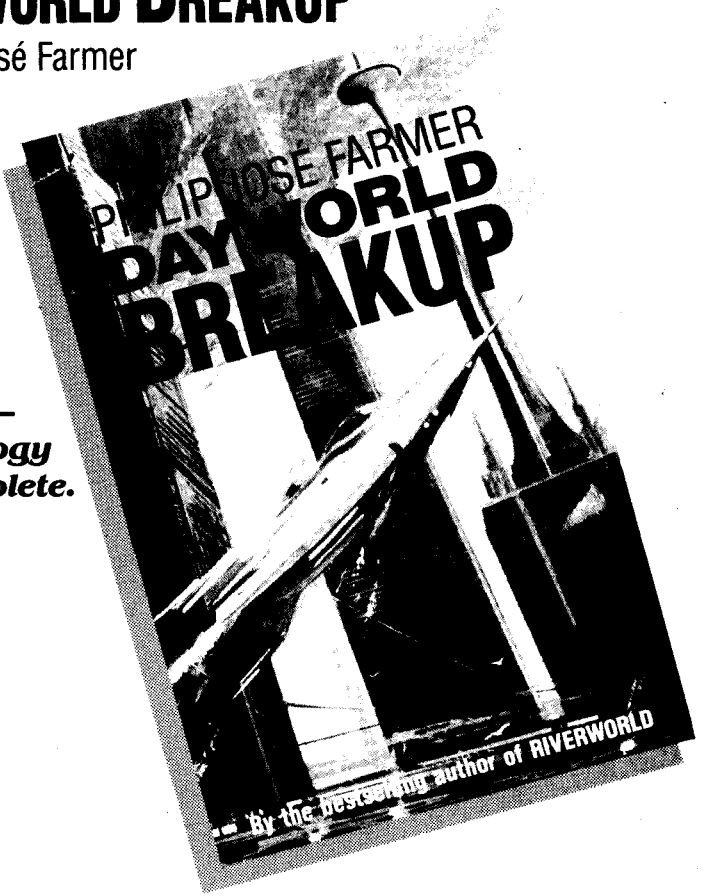
DAYWORLD BREAKUP

Philip José Farmer



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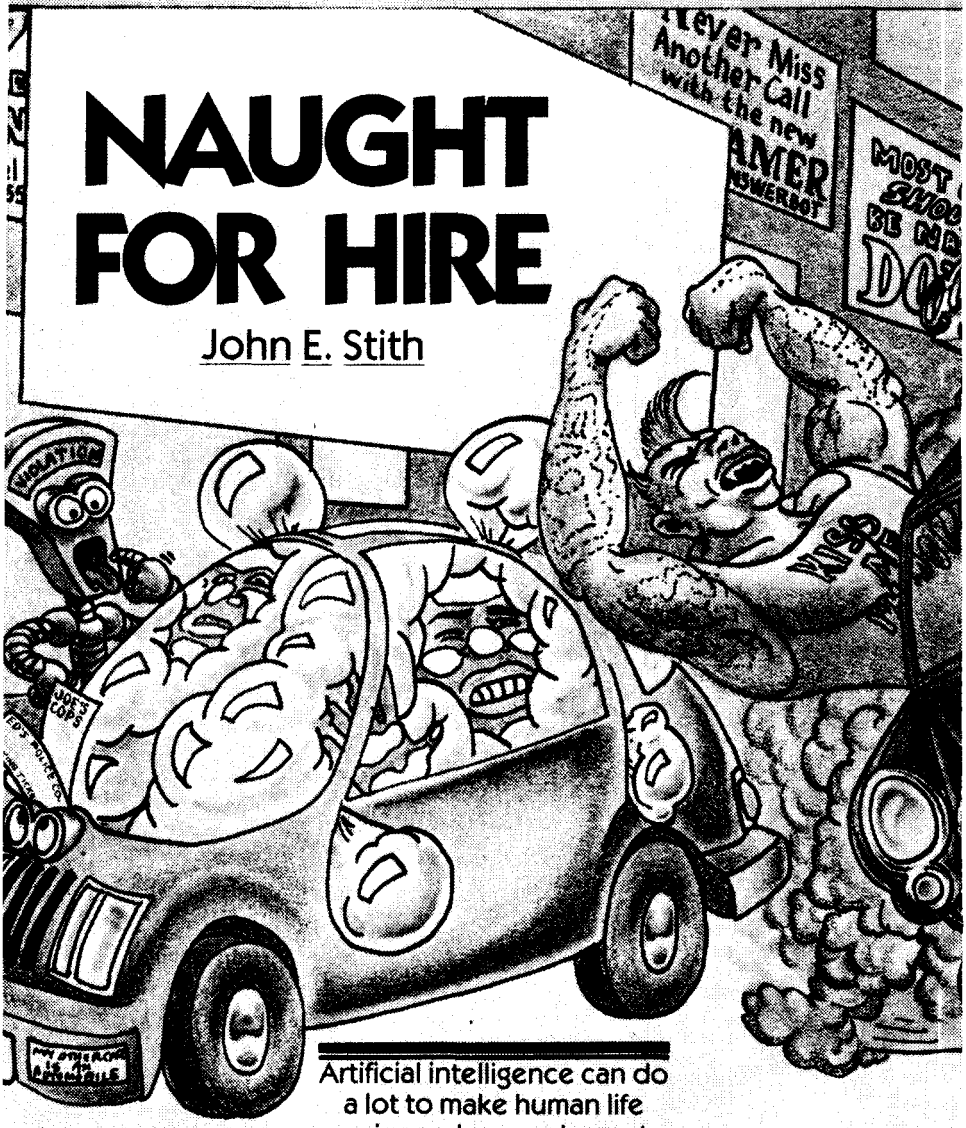
NAUGHT FOR HIRE

John E. Stith



Artificial intelligence can do a lot to make human life easier and more pleasant. The trouble is that it's a product of *human* intelligence!

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Prologue

Late at night in a deserted Los Angeles office, a telephone rang once. The echoes died as a phone answerer sprang obediently to life.

The recorded voice spoke, baritone and slightly hoarse. "Nick Naught Private Investigations. I'm not all here right now, so please leave a message or a threat."

A soft voice came from the speaker. "Nick, this is Heather. I'm free next weekend, and I've got a neat new vid on massages. Call me if you're interested, OK?" A high-pitched click *gave way to dial tone, then silence filled the Spartan office.*

In the phone answerer, the message waiting circuit turned on. Then, softer than the faint air-conditioning whine, a small voice said, "Nahhh."

The message waiting circuit turned off.

An attentive listener, who by this time of night would have been bored silly, could have heard an ever so faint laugh.

Chapter 1

In a one-bedroom L.A. apartment, faint gray light, nearly exhausted from having traveled through thick smog, penetrated a window and illuminated a wall poster showing a South Seas island. The vivid blue water and the sparkling white beach, backdropped with an array of greens, would for some people have been almost enough to displace the sensations of thick air and gritty streets.

Next to the poster hung a framed quote. Lettered in the same mock-stitch style as folksy home-sweet-home signs, the words read, "Nostradufus: I have seen the future and it sucks."

The sound of a distant siren rose and fell like waves lapping against the shore, and the noise mingled with Nick Naught's relaxed breathing. A faint smile on his lips said he was dreaming he was on the island pictured near his bed, probably lying back in a comfortable beach chair and sifting the sparkling clean sand through his fingers.

From near Nick's bed came a soft *click*.

Ending the calm and untroubled atmosphere, the digital alarm clock began to play the only song it knew: Reveille. Three surfaces of the alarm clock showed cracks from having fallen to the hard floor. Two segments of the display were out, so the eight looked like a three. The alarm droned on, its tone more like a kazoo than the bugle it had started life as.

Nick snorted and squeezed his already closed eyes even more tightly closed. For an instant, he wished he was some kind of mutant and could squeeze his ears closed.

He fumbled for the alarm. Almost immediately he knocked it onto the floor. The alarm bounced, and two final notes trailed off into silence, as if an arrow had taken the life of a very conscientious bugler.

Nick made a feeble attempt to rise. He imagined this was how it felt to be just coming out of open-heart surgery. He touched his chest, to see if he could feel any stitches or syntheskin. Nope.

After a deep breath, he hesitated, then grabbed for something beside the bed.

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His fingers made contact on the second try, and he pulled it up to his level.

A jumper cable.

Still mostly asleep, he bent forward and after a couple of tries managed to fasten the black cable to a band affixed around his ankle.

His fingers fumbled by the bed again and came up with a red jumper cable, which he fastened to a band around his wrist. His wrist flopped back onto the bed, and the cable swayed but kept its grip. The other end of the cable led to a large, heavy battery beside the bed. On the side of the battery was a colorful label saying, "Morning Jump Start."

Nick yawned and sighed. He fumbled again, near the head of the bed. His fingers found a large switch. He patted it the way a small child would pat a stuffed bear that had strayed too far from reach.

It was time. If he quit now, he'd be fast asleep in seconds. He summoned strength, and he flicked the switch that triggered a shrill electrical buzzing noise reminiscent of a failing neon sign. Nick was instantly galvanized. His eyes popped wide open, then promptly squeezed closed again. He screamed and writhed on the bed, like a snake with its tail caught in a mouse trap.

Barely able to muster a rational thought, he reached for the switch to turn the current off. Where was it? He fumbled for it. His fingers touched it! And he knocked it onto the floor. God, no, he must be wrong.

He groaned agonizingly, like a patient in electroshock. Still writhing under the pain and struggling madly, he reached for the floor and groped for the switch. Sweat stood out on his forehead. Where was that switch? This couldn't be happening. He searched to the left and searched to the right, and finally his fingers reached the switch housing. He maneuvered it so his fingers found the switch itself, and he finally managed to turn it off.

Instant silence. Nick fell back to the bed and resumed breathing. He rubbed his eyes and began to relax, feeling hardly more energetic than when he had first awoke. After a long minute, he finally dragged himself into a sitting position, legs over the side of the bed, and sighed. He blinked hard several times. Even the dim light seemed bright.

He said, to no one in particular, "Man, I hate Mondays."

Nick pulled the jumper cable off his ankle and let it drop to the floor. He pulled the cable off his wrist. He stared at the one from his wrist for a long second, then looked back at the switch. He moved the jumper cable toward his wrist and away again, and now that he could think clearly again, he realized he had not needed to look for the switch. He grimaced and got out of bed.

He managed to stub his toe on the way to the bathroom.

Squinting in the brighter light at the bathroom mirror, Nick sprayed a white foam into his hand. He spread it over his stubble, then rinsed his hands. He rested his hands on the sink until, moments later, he picked at the edge of the foam, which had turned hard, like a rubbery mask. With an abrupt, firm yank, he ripped the whole thing off his face, and screamed. He inspected his smooth cheeks as he dropped the foam mask into the toilet and flushed. As the mask swirled in the water, it dissolved, leav-

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ing what was left of his stubble in the bubbling remains.

Nick was feeling a little more awake by the time the elevator reached his floor. *Bing*. The doors opened. As Nick entered the empty elevator, it said, "Good morning!" in a voice inhumanly cheerful for this time of day.

"Morning," Nick forced himself to say.

"What floor please?" The elevator's voice was copied from a nerdy, bow-tied, comic actor of a decade past. Mixed in with the overdone cheerfulness was a nasal twang.

"One," Nick said softly.

"Thank you!" The elevator sounded as pleased as Pinocchio had been at becoming a real boy.

The door closed, and the elevator dropped two floors before it had to stop for another rider. The doors opened, and a frowning, burly guy got on with Nick. The man's coat sleeves were so short, his digital watch showed on the arm with the briefcase.

"Good morning!" said the cheerful elevator.

"Morning." The man's nod took in Nick. He turned around to face the door and assumed standard elevator posture, dutifully looking at the motionless floor indicator.

"What floor please?"

"Five," said the man. His voice seemed to be naturally loud thanks to the smooth walls reflecting the sound so well.

The elevator hesitated. "What?"

The man spoke louder. "Five."

"What?" asked the elevator, using exactly the same intonation it had used the first time.

Nick grimaced. He tapped the man on the arm, about to say something, but the man ignored him.

"Five!" the man shouted.

Nick winced.

"What?"

Nick sighed and put a hand over his eyes. The high volume made his head hurt.

The man screamed, "Five!"

"What?"

The man's face colored. He sucked a full load of air into his chest and moved toward the microphone grill.

Nick whispered quickly, "Five." Experience had told him the elevator's voice-sensitivity setting was out of whack.

"Thank you!" said the elevator.

The man, still with lungs bloated with air, looked at Nick, amazed, as the elevator doors finally closed. The two men dropped in silence four more floors, and the elevator admitted a woman wearing a green business suit. In one hand, she held a book-viewer that seemed to absorb most of her attention.

"Good morning!" said the elevator.

Apparently absorbed in her reading, the woman ignored it. The elevator doors stayed open.

The elevator said, "I *said* good morning."

The woman suddenly looked up from her display, and her eyes opened wide in surprise. "Morning."

"What floor please?" the elevator asked, sounding much happier.

"Six."

The burly guy looked like he was hoping the elevator would give her a

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hard time, too, but the elevator merely said, "Thank you!"

The man looked disappointed as the elevator doors closed and the elevator started to drop.

It stopped at the sixth floor and the woman got off.

"Have a nice day!" said the elevator.

The elevator dropped to the fifth floor, where the burly guy scowled at the speaker grill and got off.

The elevator repeated its refrain. "Have a nice day!" As the doors began to close, the elevator voice added, more softly, "Dipstick."

The burly guy hesitated, still facing away from the elevator, probably trying to decide if his ears were playing tricks on him, or if Nick had said it. Before the guy could turn around, the elevator doors closed very quickly.

Chapter 2

Nick nodded to the doorman as he stepped onto the sidewalk and drew in a deep breath of stale morning air. The sound of a couple of distant sirens rose and fell almost in unison. Nick glanced around at the rows of parked cars along the sides of the dirty street, feeling sad that he hadn't been somehow magically transported to a South Seas island while he slept.

Parked so closely to the car in front of it that there was no space to squeeze through, sat a pickup truck with a gun rack containing an AK-47 assault rifle and a bazooka. The car next to it was a bubbled three-wheeler with its front tire flat. Nick patted his pocket to make sure he still had his key, then walked past two more cars and started across the street. He saw only one slow-moving car nearby, and he returned his attention to looking at his own car as he approached it, wanting to make sure nothing had happened to it overnight.

That one slow-moving car, a fairly new Subarota Minx, held one passenger, an old lady wearing a beige hat.

The car was halfway down the block, cruising smoothly on autopilot as the driver knitted. Without warning, the car abruptly lurched forward, accelerating fast. The old woman missed a stitch.

The woman looked up in horror. She started to bang on the dash. "Oh no! Stop that! Stop it!"

The car barreled toward Nick, who walked in complete oblivion, wondering if that scratch near his front fender was new. Finally, with less than two car lengths left to go, Nick glanced toward the oncoming car, seeing its headlights flicker on and off as the car hit bumps in the road. He scrambled madly out of the way, barely managing to throw himself between two parked cars as the Subarota flashed past. An instant later, the car plowed into the string of parked cars. Sound died, leaving only the ticking of contracting metal and the dripping of fluid.

Nick got to his feet and dusted himself off. He trudged toward the wreck and muttered under his breath, "Man, I hate it when this happens."

He reached the wreck and pulled open the passenger door.

The old woman sagged forward, constrained by her seat belt. She seemed dazed, but fortunately the knitting needles had done no damage. Her eyes opened wider and she surveyed the view ahead, then looked up at Nick. "Oh no. My brand new car. It just—took off. I don't

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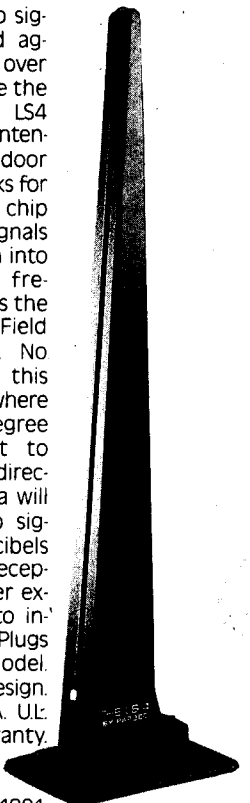

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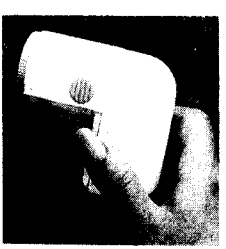

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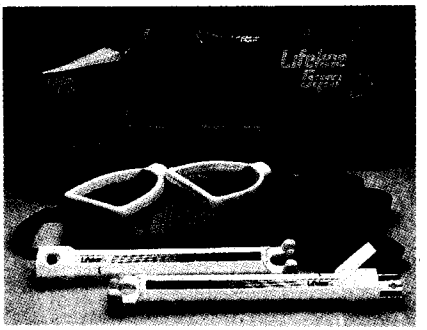

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know what happened. I'm terribly sorry. It was an accident."

Nick glanced at the damaged cars. "No harm done." He turned to the doorman and yelled, "Call the cops, will you? We've got another runaway."

The doorman called back. "I just did. They're still on delayed reporting."

Nick nodded his understanding. Just as he turned back to the woman, the air bag controller belatedly activated, and the bag blew up in the woman's face, hammering her body backward into the seat. The air bag reached a knitting needle, and suddenly the bag exploded like an enormous balloon.

Nick hadn't heard anything that loud since he'd forgotten his earmuffs at the target practice range. The woman looked like she'd *never* heard anything that loud.

Several miles away, a midnight-blue van pulled out of an alley garage which bore a sign saying, "Major Opportunity Business." The unmarked van knocked an old man and his shopping cart out of the way as it pulled into the street.

Across town, a switch activated, and the automatic garage door on an expensive house rolled slowly upward. Ed Taylor walked forward, preoccupied, as the door rose. He avoided the bike lying in his path as he straightened his tie. Ed was a big man, with broad shoulders, a pot belly, and thinning hair.

If the garage door had worked properly, his head would have passed just under the bottom of the door. Instead, the door suddenly reversed just as Ed reached it, and his forehead smacked soundly against the descending edge.

"Damn it!" he said.

Ed struggled, pushing up on the door to get it to quit closing. Finally the door responded and started up again, resuming its interrupted course. Ed muttered and rubbed his forehead as he walked toward the rolled up newspaper lying near the front hedge. Behind him, the garage door continued rising without stopping, until finally the wood began to splinter and break under the constant pressure. A window popped loose from its surroundings and fell to the concrete, smashing thoroughly as it hit.

Oblivious, Ed stooped to grab his morning paper. Just as his fingers almost touched it, the paper jerked out of his reach. For the first time, Ed noticed that tied to the paper was a string leading into the hedge.

"Damn it, you kids. That's not funny!"

Watching from the window, Ed's son Alex grinned.

Ed took another step and reached for the paper again. It jerked away again. This time Ed moved faster, trying to reach it before the string yanked it away again. By now he was right next to the hedge.

Ed didn't get another chance to grab the paper. Suddenly a thick arm reached through the hedge and grabbed him, pulling him off-balance into the hedge.

On the other side of the hedge, Ed found no neighborhood children. Instead, two large, strong men met him. One of them, who sported large tattoos up and down both arms, had a small aerosol can stuck in one pocket. The other man had flaming red hair cut tent style. Ed's unsuccessful struggle lasted only seconds before they had him pinned

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to the ground. A second later a sweet-smelling spray in the face rendered his unconscious.

The two men manhandled him to a waiting midnight-blue van and dumped him inside. The tattooed man started the engine and made a U-turn.

The van's tires screeched as it lurched forward and sped away, narrowly missing a kid on a bike, and forcing the kid into a fence.

The red-haired man took a time card from a slot over the sun visor and looked at his digital watch before he filled in the next entry.

Nick Naught pulled into the street. As he passed the next intersection, he saw down the side street a scene much like the one he had been in earlier. A runaway car crashed into a parked car as pedestrians scattered. Several nearby witnesses started to help, so Nick continued on his way.

Nick put his little finger in the ear that had been closest to the air bag explosion, and he wiggled the finger. He pulled it out, listened for a moment, and repeated the process.

A police car flashed past, siren on, lights flashing.

Nick turned his attention to the road ahead. "Radio on."

"Whatever you say," the car voice replied. The voice was feminine and sexy, with just a trace of huskiness.

The radio started playing some classical selection Nick didn't recognize. He banged his fist on the dash and the station switched to rock.

At a modest house in a different section of the city, Annette Taylor came out her front door. She was dressed for work, looking trim, and moving confidently. Today was going to be a good day. She had an appointment with her boss at the agency about the possibility of taking on a large, valued client.

In the front yard stood a very large tree. On Annette's side of the tree was a rolled up morning newspaper. On the other side of the tree were the two musclemen and the end of a string tied to the newspaper.

Annette spotted the paper. "Go get it, boy!" she called, and her collie raced out the front door and grabbed the newspaper. The string drew tight. The dog growled through clenched teeth. It knew *this* game. The dog shook its head from side to side and lowered its hindquarters, pedaling backwards. The tug of war lasted only seconds before the string broke, and the dog rushed triumphantly inside with the paper, happy about the battle it had won, and not too curious about who had been defeated. Annette closed the door and started for her car.

One of the men pointed to the van. "Quick!"

The men raced to the van. The tattooed man started it up as Annette was starting her car. They pulled the van forward quickly, blocking the driveway, and the engine died.

In her rearview mirror, Annette saw the two large men getting out of the midnight-blue van, guns in their hands. Without taking time to figure out why this was happening, and what they were after, she knew this wasn't a typical Monday. She twisted the wheel and goosed the engine. She almost mowed down the red-headed man as she raced

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around the van, knocking trash cans into the street.

The two men hopped into the van as Annette's car sped away. The driver flooded the engine as he tried to start it. The engine just spun slower and slower as the smell of gasoline filtered into the van and the squealing of Annette's car tires faded into the background.

Nick pushed through the revolving door into his office building lobby.

"Wanna buy a paper?" asked the newspaper vending machine. The machine's tone of voice gave the impression of hawking some illicit thrill.

"Sure," Nick said.

"That'll be six bucks."

Nick ran his credit card through the slot on top of the box. The machine's face opened, and, with a practiced motion, Nick snatched a paper just in time, as the lid snapped down *very* fast, like a bear trap.

"Have a nice day," said the vending machine.

As Nick waited for the elevator, a teenage boy in a striped shirt approached the coffee vending machine.

"I wouldn't bother, if I were you," Nick said.

The teenager ignored him and said to the machine, "Coffee, black."

Nick shrugged. As the elevator doors opened, the vending machine squirted coffee all over the kid's shirt and pants.

In Nick's unoccupied office, the phone began to ring. The phone answerer clicked on, and Nick's voice said, "Nick Naught Private Investigations. Leave a message. Unless you're with a collection agency." *Beep.*

"This is the Internal Revenue Service, Mr. Naught. Yesterday you missed your third audit appointment. Be in our office at two today, or a warrant will be issued for your arrest."

The phone answerer clicked off only seconds before Nick entered the office. He put the paper down on the desk and looked wistfully at the large South Seas island poster on his office wall. Finally, he pressed a button on the phone answerer.

"Sorry," the answerer said. "No messages."

Nick sat down at his desk. The desk clock read 2:30 A.M. He shook his head and pushed the clock slowly over the edge, where it landed with a *clunk* in his wastebasket.

Annette watched the elevator floor indicator stop. She leaned forward, anticipating the opening of the doors, but they stayed shut. She looked around to see if the elevator had an emergency bell switch.

Suddenly, in a voice mimicking the voice of a short, web-footed cartoon character almost always seen in a sailor suit with large buttons, the elevator hummed. It played the theme from "Twilight Zone." "Do do DO do. Do do DO do."

Annette banged on the control panel.

Finally, as the doors opened, the elevator voice laughed. "Wahhh. He he he he."

Annette knocked on the door saying "Nick Naught Private Investigations," then, without waiting for an answer,

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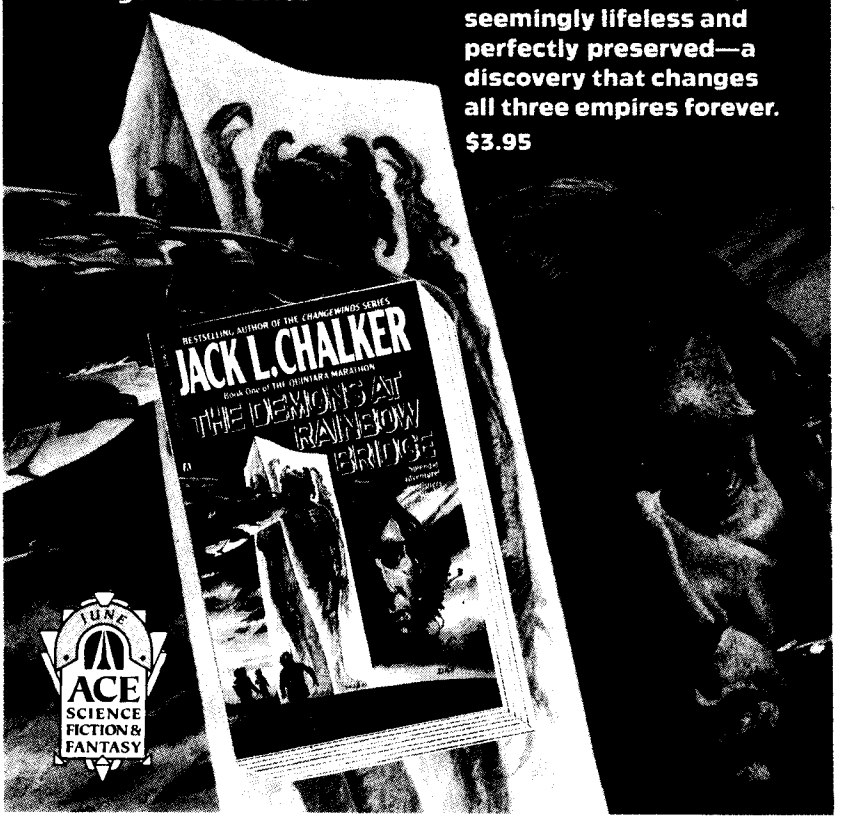
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entered the office. She patted her hair into place, and glanced over her shoulder toward the elevator door in the hallway.

"Hello, Nick," she said.

Nick thought she looked sad, but she also looked determined, businesslike. Her hair was longer than he had seen it last, and the change looked good on her.

Nick got to his feet slowly, confused about why she would be here after all that had gone on between them. "Hello, Annette. I have to say I never really expected to see you here." Nick felt his insides start to churn, and he suddenly felt as forlorn as he had four years ago.

"I need your help," she said simply.

"After four years?"

Annette shook her head. "Let's not start in on it, all right? What's done is done. I wouldn't be here if I didn't figure I needed someone like you."

Nick was silent for a moment, considering. Finally he gestured at a chair. They both sat. "OK. Today's business. Let's hear it."

Annette's calm facade crumbled a little, and she fidgeted. "Ed's been kidnapped. And someone tried to get me, too."

Nick leaned forward, concerned. "Why?"

"That's the worst part of all. I have absolutely no idea."

Nick caught his thoughts moving to the past, and he forced himself to think about the present. "I don't watch much television. Your brother's still a reporter for KSMY?"

Annette looked at him directly. Her eyes had a pained look Nick had seen before. "Yes. I already told them about it. Two big guys grabbed him this morning. One of the neighbors saw part of it out his window. They were probably the same two guys that were after me. Muscle guys I'd never seen before, one of them with lots of tattoos."

"I suppose you already called the police?"

"Sure. But they don't have time to do anything this month. They're too busy already."

Nick nodded and went through a mental checklist. "Did anything unusual happen recently? Did Ed meet a new woman, take out a big loan, buy a gun, take out insurance? Anything at all out of the ordinary that you know about?"

"Nothing. It's just been business as usual." She hesitated. "His wife is in the hospital, but I really don't see how that would relate to Ed being kidnapped—or to anyone coming after me."

"Anything else you can think of?"

"No, nothing. I put some of the things you might need in this envelope. His home address, things like that. And I wrote down descriptions of the two guys. Will you help?"

Nick sighed softly, not asking any of the questions he most wanted to ask. "Yeah. I've got a friend down at KSMY. Maybe he knows something that can get me started. I'll call him as soon as we're done talking."

Annette nodded. She seemed to have a hard time meeting Nick's gaze now. She glanced at the wall poster. "It looks so peaceful."

"Yes, it does. Which reminds me. My fee is a thousand a day, plus ex-

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penses. How about if you give me a retainer for a couple of days?"

Annette nodded again. She pulled out a credit card.

Nick took a charge card setup from a desk drawer. As he ran his company card and her card through, the machine spit his card across the room, where it landed in an in-box placed there to catch it. Nick walked over and retrieved the card. He handed her a receipt. "You still save your carbons?"

"Yes, please."

Nick started tearing out the little sheets of carbon paper. There must have been nearly twenty of them in the stack. Annette put them in a small card file she kept in her purse.

She managed to give him a level gaze. "Thanks, Nick."

"Where can I reach you?"

"You can't. I'm not about to go home now. I'll find a hotel and call you later."

Nick nodded. Annette rose and walked to the door. As she closed the door behind her, Nick looked up and sighed.

He shook his head, as if doing that would clear away the old thoughts, then picked up the phone. He dialed a *long* number.

"Thank you for using AT&T," said a voice on the line.

Then, "Thank you for using Sprint."

"Thank you for using MCI."

"Thank you for using US West."

"I'm sorry. Your call cannot be completed. Please check the number and dial again."

"It must be some problem with AT&T."

"*Correction*. It must be some problem with *Sprint*."

Nick slapped his forehead. He felt tired. He put the receiver down, and tried again.

"Thank you for using AT&T."

"Thank you for using Sprint."

"Thank you for using MCI."

"Thank you for using US West."

"Thank you for using Lucy's Phone Network."

"Hello. This is the president speaking."

Nick's head jerked up. "President of what?"

"Of the United States. Who is this?"

"Ah, sorry, sir. Wrong number."

Nick hung up. He rose and started for the door.

Chapter 3

In another part of the city sat a large office complex with a sign out front sporting block letters that said "Major Opportunity Business." Inside, two executives sat at a conference table.

Mike McCormick, the company president, listened to the end of the briefing. He was a prematurely graying man with small gold earrings. The briefer was a senior company officer, Paula Rosenberg. She was about ten years his junior, and wore neither makeup nor earrings.

"That's fine," McCormick said when Rosenberg finished her old-business briefing. "Do it. Any new business?"

Rosenberg ran a finger down her list of notes. "Only one thing today. You remember David Turvey, the accountant who testified at the Williams trial?" As she spoke, she opened a notebook, extracted a photo, and slid it to McCormick. The photo was of a man in his sixties. Underneath the picture, large letters said, "David Turvey." Rosenberg went on without waiting for an

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answer. "The Philadelphia branch has verified that Turvey has definitely accepted a new identity and a disguise from the witness protection program. He's now here in town, using the name Nick Knott."

Rosenberg slid another photo to McCormick. The second photo was of the same man, but it showed an idiot mustache that looked like it had been just scribbled onto the photo with a large black marker. Underneath in large letters was, "Nick Knott."

"Your recommendation?" McCormick said. He looked at his watch.

"Send out a dispatch team. Have them do an analysis and complete the task. It should look like an accident."

"Fine. Is that it? I need to get to that charity luncheon."

Rosenberg leaned into Cynthia Willis's office door. "Willis, I need you to run a dispatch on a Nick Knott. An 'accidental.' "

"Can it wait 'til after break?" Willis asked. She had been just about to get up when Rosenberg arrived.

"Do it now, will you? It's for McCormick." Rosenberg started to leave.

"Gotcha. Is there a special charge number or just overhead?"

Too late. Rosenberg was already gone. Willis looked at her clock, which read 09:55, then quickly turned to her computer terminal. She grabbed a form and filled in a couple of blanks as she spoke to the terminal. "Give me a file on Nick Knott."

She rose impatiently, waiting on the machine. A moment later it spit a photograph out a slot in the side of the machine. The photo wasn't exactly like the one Rosenberg had had. The image was different, and below the photo were several lines of small text headed in large letters with, "Nick Naught."

Willis grabbed the photo before it could fall into the wastebasket below the slot. She stapled the form to the photo and rushed out.

Only a moment after she had left, the computer spit out a different photo, the one for Nick Knott. The photo fell into the wastebasket.

Willis ran down the hall. She passed sections labeled "Accounts Terminating," "Numbers," "Security," "Laundry," and "Protection."

Don Lyeth was sitting at his desk when Willis rushed in and dumped the paperwork in his in-basket. Lyeth wore a bow-tie and had his shirt sleeves rolled up. His desk was perfectly neat, and even the two pieces of paper on top were lined up precisely parallel to the edge of the desk.

Willis started to leave. "Gotta run," she said.

"Hey, hey, hey. Not so fast," Lyeth said. He examined the form, then frowned like an auto mechanic with bad news.

"What's the problem?"

"What's this?" Lyeth asked. He shook the paper in the air. "We haven't used a form fifty-six for months."

"It's a dispatch. That's what I've always used."

"Not anymore. Form two-twelve." Lyeth slid a new form to her.

Willis scanned the paper and filled in a few of the blanks. "OK. Look, I really gotta run."

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"Not yet."

"What now?"

"You left the suspense date blank. And you didn't check 'accidental' or 'doesn't matter.' "

Willis filled in a date a week in the future and checked "accidental," then handed the form back. Lyeth examined the form for a full twenty seconds before he dropped it into another basket. "OK then."

Chapter 4

Nick waited impatiently in the KSMY lobby. A receptionist with a cubed hairdo sat behind a desk and chewed gum. Next to the desk, a TV monitor showed the current live feed from the station, with news personalities Howard Darling and Connie Costanza. Through an adjacent glass wall, Nick could see the studio with Howard and Connie on the air. The red light on one of the cameras went on.

Howard started on cue. "And now, the kiss-my twelve o'clock news with Howard Darling and Connie Costanza." Howard was slightly pudgy, and his hair stuck out over his ears.

Connie took over. She was immaculately dressed and could have passed for a glamorous vid star, her straight black hair sparkling clean. "In the news today, three more air crashes in the United States and two abroad. A train derailed in New Jersey. Here at home there were almost fifty car accidents since this time yesterday. And today makes the 500th straight day of delayed accident reporting, nearing the record previously set about three years ago."

While Connie was talking, Howard was handed a note. He read it and was about to ask a question of someone off screen when he saw the camera was back on him and Connie had finished.

Howard stumbled. "Er—I've just been handed a special bulletin. Please stand by." Howard put on a nonchalant air and showed the note to Connie as he pointed to a word.

"Subpoena," Connie whispered.

Howard brightened. He took the note back and began to read. "In an unprecedented act, the Justice Department today issued over twenty *sub*poenas to descendants of the group of decision-makers originally responsible for the breakup of the telephone company."

During Howard's story, Connie seemed to have a sudden urge to scratch her nose. Nick was positive she was trying to suppress a grin at Howard's mispronunciation. Howard's gaze flicked toward her, and a frown crinkled his forehead. He resumed the story and was almost finished when his watch alarm sounded. He tried to unobtrusively turn it off, but in the process he knocked over his glass of water. Instantly, like a cat caught making an error, he assumed a blank expression that said, "What's the probiem. I didn't do anything."

Connie shook her head sadly. Howard caught sight of the motion from the corner of his eye. He glanced at her, and she abruptly stopped and smiled innocently.

As Howard resumed, his wristwatch started to give off smoke, but he didn't notice it. "Also in the news today, researchers at UCLA have been tracking the spread of a new AIDS-like virus within the animal community. So far, the deadly virus has showed up only in

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cows, lambs, and sheep, but today it was announced that the scientists have discovered the virus in alligators." Howard hesitated before he capped the story with his pronouncement. "GatorAIDS."

The news director looked incredulously at Howard, and he smacked his palm against his forehead.

Howard suddenly realized his watch was smoking. He panicked. In the process of trying to get it off his wrist, he fell over backwards.

As the station went promptly to a rat chow commercial, a door opened, and Earle Thompson came in and greeted Nick. "Sorry to keep you waiting. Come on in." Earle's nose was large enough, his eyeglass rims dark enough, and his mustache black enough, that from a distance he seemed to be wearing a Groucho Marx disguise.

Nick followed Earle past several news people at their desks busily keying in stories. From the computer terminals came various video game noises.

Past the bullpen, a corridor led into a walled area with private offices. From the room ahead, came a short, loud buzz.

Nick glanced in as they passed the office. Next to the door was a name tag saying, "Jim Curtis." Curtis looked like a fairly normal guy in his thirties, but he was adjusting a collar with a little black box stuck on it. As they passed, Curtis shut his office door.

Nick and Earle took seats in the next office, which was Earle's. Earle was a real sportsman. Hanging on his wall were mementos: a tennis racquet with a broken head and a golf club with a bent shaft.

Nick tilted his head toward Curtis's office. "I feel kinda wasted as a private eye. I didn't know you vid guys got to wear dog collars."

"Cute. But it's not a dog collar. You ever drive a long way on manual? Get a little drowsy? Your head tilts too far forward, like you're going to sleep? That's when those things buzz real loud and wake you up."

Nick shook his head. "Boy, I could have used one of those in school. Listen, I won't take up much of your time. I'm trying to get a lead on who might have grabbed Ed Taylor, or why."

"A friend must have hired you. I can't imagine the police are getting too excited, or them finding the budget to hire independents."

"What can you tell me?"

From the next room came the brief sound of a buzzer. Earle ignored it. "I don't know. Ed lived for work. The little time he did have free he spent with his kid, Alex, or on his computer. I think he fancies himself a hacker."

"What's he been working on lately? Anything that could account for someone grabbing him?"

"I really doubt it. He's been doing some routine funding profiles. Nothing special."

From the office next door came another burst of the buzzer. Nick looked at his watch. "Can I take a look at Ed's office?"

"Sure thing. It's right down this way."

As they left Earle's office, the buzzer next door started again. This time it just kept on going and going forever.

Down the hall four doors, Earle said,

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"Here it is. I'll leave you to it. Good luck."

"Thanks. I may need it."

"You know, Nick, I hope you don't mind me saying this, but you don't look too happy. Is Ed a real good friend?"

Nick hesitated. "It's not that. It's his sister, Annette. She hired me. I hadn't seen her for about four years." Nick looked away. "Since she walked out on me."

Earle nodded. "Well, best of luck on both counts." He left Nick in the office and closed the door behind him.

Nick sat down at Ed's desk and opened the front drawer. He pulled out a sandwich that looked like it had been left there when the building was built. He dropped the sandwich into the trash can. He looked farther into the drawer, using a ruler to move stuff aside.

He flipped through a stack of paper on top of the desk and found nothing obvious.

Empty-handed, Nick walked back toward the entrance. As he passed Jim Curtis's office, with its door closed, the buzzer was still going. Nick glanced around to see if anyone was looking. He rapped the door once with the tip of his shoe, hard. The buzzer stopped for a moment, then resumed.

Chapter 5

The air was muggy as Nick walked out of KSMY. Just down the street, a man parked in a luxury car with power seats was slowly being crushed into the ceiling by the rising seat. Nick moved to help, but at the last minute, the man managed to get the seat to stop rising, and he proceeded to crawl out the window.

Nick started across the street, wondering which universal law covered always having to park on the other side of the street from where he was going, and wondering how all the people on *this* side had somehow received exemptions. He had just emerged between two parked cars, when a sludge-brown Dodge truck with yellow smog-lights right down the street suddenly began to accelerate fast. By this time of day, Nick was wide awake, and he noticed the car while it was still several car lengths away. He scrambled. He dived between two parked cars just before the Dodge plowed into one of them.

Nick picked himself off the ground and walked toward the damaged car, thinking that maybe most cars should be named "Dodge."

Behind the wheel was a guy who needed a shave and possessed a nose that looked red from too much alcohol or sunburn. Before Nick arrived, the man quickly switched a control on the dash, and a dash sign changed from *manual* to *autopilot engaged*.

Nick pulled open the driver-side door.

The driver looked up at Nick. "Man, are you OK? I'm sorry. This thing just went out of control. What a mess."

Nick looked down at his dusty pants. "I'm fine. This keeps me in shape, and it's not nearly as annoying as jogging. How about you?"

The driver looked at his face in the rearview mirror and touched his nose. "I'll be OK. I'm just a little dazed."

"Aren't we all?" Nick muttered. "Say, you'd probably better get out of there pretty fast."

"Why, what's the—"

The man's words were cut off as the

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Dodge's air bag finally blew up in his face. This bag must have had the large, economy-size gas canister, because it blew up so far that it knocked Nick backward before it exploded.

Nick drove along a business street. A bump in the road switched the radio to classical. Nick banged on the dash, and the station switched back to rock. He wiggled his finger inside one ear, then hit the heel of his hand against the side of his head.

An ambulance flashed past, siren on, lights flashing.

As Nick drove by an apartment building, a man on the sidewalk in a powered wheelchair was suddenly accelerated to warp speed and rammed into a collection of trash cans.

He knew he was getting close to the school, because he passed "Guns 'R' Us." On the right, was a building with the sign, "Hackers's Savings and Loan."

A few blocks later, Nick pulled up in front of Burbank High School.

Nick's footsteps echoed as he walked down the hall and passed by a silent large box with lights, a lens, and a speaker grill on the front. The box bore the legend, "Hall Monitor." The speaker grill suddenly came alive. "May I see your hall pass, please?"

Nick stopped and patted his pockets. "Sorry, I must have left it in my other pants." He started walking again.

"No, no, no! No one without a hall pass is allowed beyond this checkpoint."

"Sorry. I'm in a hurry. I'm not even a student."

Suddenly the hallway was filled with the sound of a machine gun spraying bullets everywhere, mixed with the sound of heavy artillery. Nick pulled his gun and crouched. Only an instant later, he realized the sounds came from the hall monitor, and he'd been had.

"Just kidding," said the hall monitor as Nick moved closer, his gun still in his hand.

"Boy, you sure got me on that one. What a riot. Ha ha ha."

Nick started to walk away again, and, as he left, he kicked the hall monitor wall-plug loose from the socket. The machine gun noises started up again, but quickly dropped in pitch and volume until the hall monitor was quiet.

"Just kidding," Nick said, and he smiled. That was probably the best time he'd ever had in a school.

Two corridors away, Nick stopped at a room bearing the sign, "Room 156, Science." He peeked around the corner into the room. A bunch of bored high-schoolers sat at desks, listening inattentively to the science teacher, an old lady who could have been teaching when Nixon was in school. She wore black shoes with large, raised heels.

"All right," the science teacher said. "Who can tell me why mountain ranges exist? Anyone."

Several students scrutinized their desktops. A pimply overachiever raised his hand.

"Yes, Danny?"

"The—ah—mountain ranges were formed by the great flood. Noah's flood."

A couple of the students looked vaguely skeptical. Several of the others looked comatose. Nick cringed.

"Danny, that's exactly right. Now what else is the Genesis flood respon-

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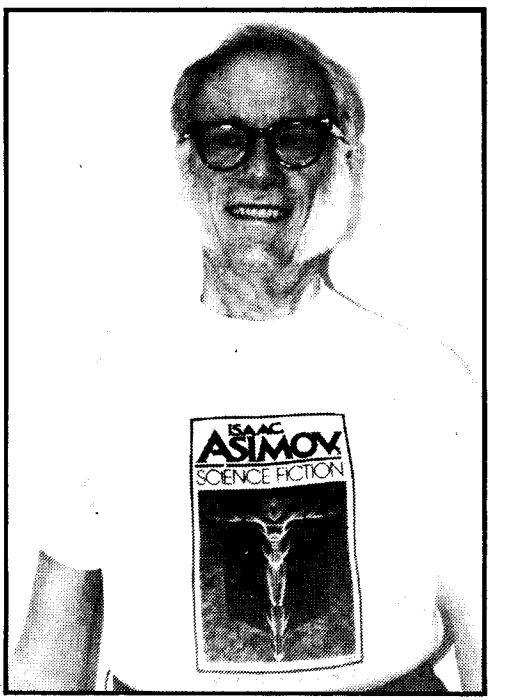

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sible for?" Before anyone could raise a hand, the science teacher noticed Nick. "Yes, may I help you?"

"I hope so. I need to talk to Alex Taylor."

The science teacher hesitated. "Are you a drug dealer?"

Nick looked over his shoulder to see if anyone was behind him. He shook his head and held up one hand in a Boy Scout salute.

"All right, Alex. But no more than five minutes."

Alex Taylor rose and came out to the hall. He was a gangly kid, chewing gum. His brown hair stuck straight out from his skull at every point, as though his head contained a large static generator instead of a brain nearly the size of a hamster's.

Nick said, "I'm trying to find out where your father might be, Alex."

"Why, what's he done?"

Nick frowned. "He was kidnapped. Didn't anyone tell you?"

"Oh, yeah. Right." Alex looked around. "Well, he ain't here." He jammed his hands into his pockets.

"Uh—yeah. Total agreement. You got any idea at all where he might be?"

"Have you looked at kiss-my? He works there. Maybe they took him there."

"I've been there."

"You know, you could just turn on the TV. He's there a lot, and you just might see him."

Nick sighed. "Yeah, well, Alex, you've been a very big help. Really. Thanks very much." He started to walk away, but Alex called after him.

"Hey, I got three more minutes."

"That's great. Probably you should lie down for a minute. I can imagine this has probably been a pretty grueling experience for you."

Nick left Alex behind and continued down the hall. The next room was labeled "Algebra," and the teacher was talking solemnly to his class. "We are gathered here together to talk about a subject *He* would have wanted you all to learn well. Yes, I'm talking about *algebra*. Yea verily, I say unto you . . ."

Nick shook his head and kept on walking. The next room, labeled "Physics," was noisy even before he reached it. Instead of having desks, the students sat in pews. The teacher was shouting in a rich, pulpit voice. "E equals M C squared! Do you believe?"

The class shouted in unison, "We believe!"

Nick wiggled a finger in one ear and tapped on the side of his head. If there was anything he believed in, it was garbage-in, garbage-out. He took the turn into the lobby. There a glass case held a picture of the school mascot, a penguin. Next to it sat a confessional booth.

Through the glass walls to the principal's office, Nick saw the principal pacing in a circle. The rosy-cheeked man wore a bishop's hat and a red robe, and held a scepter.

Outside, the air felt clammy. Nick walked down the sidewalk, trying to decide what to do next. He was almost at his car when, down the street, a car exploded, and people started toward it. Nick shook his head and got into his car. He sat there a minute before he finally put the key in the ignition.

"Your seat belt is unfastened," the car said. Its tone seemed possessive and protective.

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Nick fastened his seat belt.

"Your door isn't latched."

Nick opened the door and slammed it shut.

"Your fly is open."

Nick looked down.

"Made you look."

As Nick drove, a fire truck flashed passed him, siren on.

Minutes later, as he stopped at a school crossing, another runaway car, this one speeding straight through the crossing, sent children running for safety in all directions. A youthful crossing guard gave the runaway car a rude gesture.

A school bus parked on the street had its doors clamped tight on a squirming school kid. The kid frantically kicked his legs, which dangled out the door.

Chapter 6

Nick pulled into a parking space in front of the hospital across the street. The parking meter read, "Violation" until Nick banged the meter sideways with his fist. The violation flag went down, setting the meter to, "One Hour."

Nick winced as a teenage girl with an incredibly loud boom box passed the nearby "Quiet zone" sign. She walked by three cars in a row, and the windows in each car shattered at the sound.

On the sidewalk sat a vending machine bearing the label, "Malpractice Insurance."

"Hey, buddy," said the machine. "You got the right time?"

"Yeah. It's about one."

"Thanks. You going in for an operation?"

"Nope."

"Never mind."

Inside, Nick was walking past the emergency desk when a paramedic rolled in an injured woman.

"I'm afraid this one's a croaker," the paradmedic said to the nurse. He glanced around the room as though he had other things on his mind.

The nurse stood up fast and put her hands on her hips. "Who do you think you are? God? It's not for you to casually decide if that patient lives or dies. That's what doctors are for."

As the paramedic wheeled the patient away, the patient lifted her head up weakly and gave the paramedic an obscene gesture.

Nick approached the nurse. "I'm looking for Carla Taylor."

"Why? What's she done?" The nurse looked suspicious.

"Nothing that I know of. I'm just here to visit her."

"Up the stairs around the corner that way. Room 350."

Nick started for the stairs. All the way to the corner, he could feel the nurse's stare in the middle of his back. Feeling more comfortable after he had left her sight, he peered into an operating room. A team of gowned people stood around the operating table, watching the doctor as she held a scalpel and carefully cut into the patient. The doctor's digital wristwatch alarm went off, and she instinctively moved her hands to turn it off.

Blood spurted an amazing distance out of the patient's body, and everyone got really busy, especially the guy who got squirted in the face.

Carla Taylor's room was a double. According to the note outside the door,

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she occupied the bed nearest the door. Another patient was apparently asleep in the other bed despite the television being on. Next to the far bed stood a man trying to open a bottle of pills.

On the television was a newsbreak with Howard and Connie.

Howard said, "Another offshore oil rig leak has been detected at a Mogo platform in the Pacific. It went unnoticed for almost two weeks due to the already high levels of oil in that region." He was no longer wearing his digital watch.

Connie continued, "OPEC, the Oil Producing and Extorting Countries, issued a statement condemning the pollution. Our roving reporter, Melanie Wortham, is on the scene of the latest spill."

The view switched to Melanie. She stood on a dark substance. "Mogo issued a public apology today, and have stated that cleanup crews will be reaching the area you see here as soon as they finish the cleanup operations in the Potomac. Like, this is Melanie Wortham, speaking to you from four miles off the coast of California. Really."

Melanie walked toward the camera. Her smile tightened as her feet came loose from the dark substance with a soft sucking sound only after much resistance, and it became obvious that she was standing on solidified oil sludge. A small dirty child was building a castle in the sludge. Near the child, two sunbathers lay on towels that showed the oil seeping through. Beyond them, a sign said, "Keep off the water."

Carla Taylor switched the television off with the remote control. The TV turned itself on again, so Carla had to turn it off a second time. She watched the set intently for a moment before looking up. She was a redhead, her hair done in the spiky curl that was more fashionable among teenagers. She looked sleepy.

"Carla Taylor?" Nick said.

"Yes."

"I'm Nick Naught. Your husband's sister hired me to try to find him since the police are so busy. I thought perhaps you could help me."

Carla's attention was suddenly caught by the man standing next to her roommate's bed. He was still trying unsuccessfully to open a prescription bottle, and the child-proof cap was really getting to him. He began to get very energetic, and finally he shouted, "Damn it all!"

As his face turned red, the man gave it one more tremendous effort. The cap suddenly came off the bottle, and pills went flying. In an effort to save a few of the pills, he lunged and accidentally rammed the over-the-bed tray against the bed, where, despite his efforts to save it, a pitcher of water flooded onto the patient. The patient, a young girl, sat up suddenly and was caught in the forehead by the man's elbow as he swiveled. The girl was knocked out cold.

"Who's that?" Nick asked.

"That's Dr. Kennedy. My surgeon."

Nick took a deep breath, wishing he had read the fine print on his health maintenance plan and wishing he knew where he would be admitted if the occasion arose. He asked, "What are you in for?"

"Well, at first I just wanted to have a wart removed. But we got to talking, and I signed up for this new procedure

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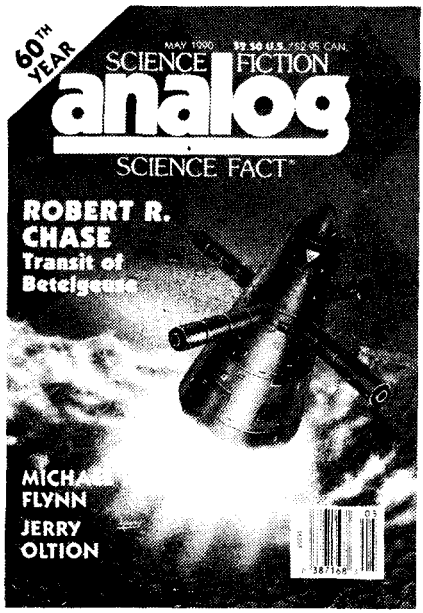

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to improve my memory. It was just a twenty-minute operation, and I'm almost fully recovered already. It's supposed to improve my short-term memory, my long-term memory, my learning rate, and—did I mention short-term memory?"

"Yes. You did."

"And did I mention short-term memory?"

"Mrs. Taylor, I need to ask you—"

"Why did you call me Mrs.?"

Nick felt sick. "This isn't going to work, is it?"

"I don't think so. Er—what isn't going to work?"

"Just lie quietly. I hope I didn't upset you." Nick started to leave.

"Yes, I'm fine," Carla said.

Dr. Kennedy, still cleaning up, dropped the pitcher on his toe. He used some words Nick had never heard before, and Nick wondered if they were medical jargon.

Nick retraced his path, feeling unproductive. In another operating room he passed, a medical team surrounded a patient on the operating table. The heart monitor was *beeping* at the right intervals, but suddenly it stopped. The medical team began to pack it in.

The patient's head rose. He looked panicked at seeing everyone leaving. He looked over at the heart monitor that said he was dead. His mouth worked soundlessly. He clutched his chest and fell back to the table, apparently dead. The heart monitor started *beeping* again.

As Nick exited the hospital, a meterperson had just reached his car. The meter still said "One hour." The meterperson pulled out a small rubber mallet and whacked the meter lightly. The "Violation" flag came back up, and the meterperson proceeded to write a ticket. As Nick took the ticket and got into his car, the meterperson grinned and made one hand into a gun, as though to say gotcha.

Chapter 7

Nick kept a frequent watch on the rearview mirror as he drove, not wanting to be rear-ended by an emergency vehicle. He passed First Chapel of Elvis. For a weekday, it looked fairly busy. A group of four people in white pants with sequins were just going inside.

Nick caught the flashing light in the rearview mirror in time to pull to the right. A car flashed past, red lights spinning, siren on. On the side of the car was a sign saying, "Pizza."

Nick gained on a tanker truck bearing a sign saying, "Caution, Nuclear Waste." From the back of the truck leaked a steady stream of brown fluid. Nick pulled out far enough to see the reflected view of the driver, who wore a gas mask and headphones. Nick slowed down to give the truck lots of space and tried to keep his wheels straddling the flow.

Minutes later, as he neared the office, he approached an intersection showing a green light.

Approaching the same intersection, from the cross street, was a large truck. The traffic light for the truck was green also. Nick's car grew closer and closer to the intersection, maintaining full speed. Finally it was obvious to the truck driver that Nick's car was not stopping for the light. The driver gave the horn a long blast.

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At the sound of the horn, Nick took his eyes away from the rearview mirror, and suddenly realized the truck was about to broadside him. He jammed on the brakes. His car skidded sideways, and the truck sped past, just missing Nick's bumper.

Nick yelled, "Idiot!" As he yelled, he heard the truck driver call him something even less flattering.

The car said, "Take it easy, big boy."

Nick pulled over to assess the damage. From where he parked, he could see the light from both directions. It was green in both. As he watched, one direction went instantly from green to red, and a pickup truck had to slam on its brakes.

In a van parked in a nearby parking lot, Dennis Cotton, the red-nosed man who had almost hit Nick earlier in the day, watched as Nick got out of his car and walked around it. Dennis raised a car phone to his mouth. "Damn it! I thought we had him."

Dennis hung up, started the van engine, and headed toward the exit. On his way out of the parking lot, he saw a shiny car parked diagonally and taking up two parking spots. With only the barest hesitation, Dennis deliberately veered close and creased the car door with his bumper. Satisfied at having done *something* productive this time, he said, "I always wanted to do that."

On the way through his building lobby, Nick passed a man with his hand stuck in the newspaper vending machine. The guy tried unsuccessfully to get loose, as the doorman looked for the right tool to fix the problem. Nick waited for the elevator, the lobby too noisy for his taste because a customer was banging on the coffee machine.

In Nick's empty office, the phone rang, and the phone answerer clicked on. "Nick Naught Private Investigations. Mr. Naught is out of the office, making the world safe for capitalism and the IRS, so please leave a message." *Beep.*

"Nick Naught. Nick Naught, who's there? Sorry. I shouldn't do that. Mr. Naught, this is the lottery commission. Our records show you have a winning ticket. You need to produce it by five today to claim the five million dollars. Please call us."

Not five seconds after the phone answerer clicked off, Nick entered the office. He pressed a button on the phone answerer, and the machine said, "Sorry. No messages."

Nick sat down at his desk. He picked the clock out of the wastebasket. It still read 2:30 A.M. He dropped it back in.

The phone rang, and he picked it up. "Hello."

The phone answerer message started up again. "Nick Naught Private—"

"I've *got* it," Nick said.

"Sorry. You don't have to yell."

Annette's voice came on the line. "I'm glad I caught you, Nick. I wondered if you'd found out anything yet."

Nick looked at his watch. "To tell you the truth, this case is going a little slower than normal. I've checked at the office and with his wife and son. They both must have had a few knots in the old umbilical cord."

"Maybe there's something at the

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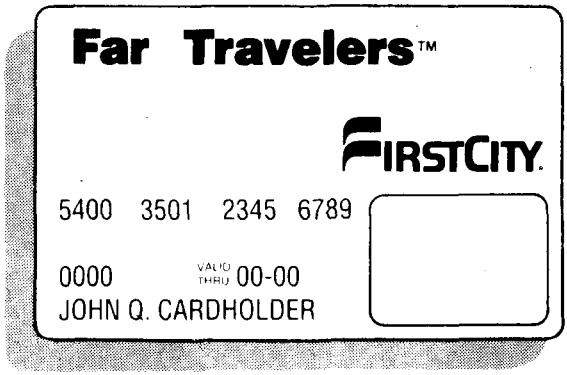
The Shape of Things to Come



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house that would help. I could meet you there."

"All right. But I'm starved, so I'm going to swing by Big Burger. Meet you at the house in an hour and a half?"

"Right."

A moment after Nick hung up, the phone rang again. Nick picked it up. "Hello."

The phone answerer message started up again. "Nick Naught Private—"

"I've *got* it."

The answerer said, "I knew that."

"Mr. Naught, this is G. David Chamness. I've been trying to establish contact with you for days. We communicated last week regarding my client's impending suit identifying you as the defendant." In the lawyer's office, his desk stretched almost the full width of his office. Behind him was a wall-to-wall, floor-to-ceiling bookcase entirely filled with books with identical bindings.

"Hang on a minute, OK?" Nick opened a desk drawer and retrieved an auto translator with one knob and a screen on it. The screen currently said, "French." Nick set the device on top of the desk, attached a cord to the phone, and turned the knob. The screen changed rapidly to "German," then to "Doctor," "Politician," "Punk," and finally to "Lawyer."

Nick said, "Don't you think 'impending suit' is a little strong? 'Petty harassment' would be closer."

"I don't think you fully appreciate the enormous gravity of the circumstances in which you find yourself enveloped."

The auto-translator screen said, "I'm serious."

Nick leaned back. "Can you speak up? The connection is fading."

"My client proposes to prosecute to the maximum extent of the pertinent statutes."

The auto-translator screen said, "He wants everything he can get."

"I'm having trouble taking this whole thing seriously. I mean the guy was holding up a convenience store. He had a gun. The owner and a customer can back up my story. And can you speak louder? This connection is terrible."

The lawyer raised his voice to nearly a shout. "In actual point of fact, the weapon in question was a facsimile, one fabricated from molded plastic and acquired at a K-Mart."

The auto-translator screen said, "The gun was fake."

"Sure. But how was I to know that? And can you speak louder?"

The lawyer was actually shouting by now. "That's precisely my contention. You were not appraised of the full extent of the situation. Yet you proceeded to wound the plaintiff with a projectile weapon."

The auto-translator screen said, "You shot him."

"What? Louder."

The lawyer sounded near apoplexy from shouting so loud. "You willfully caused my client substantial pain and suffering by your wanton disregard for his unalienable rights."

The auto-translator screen said, "He missed a hot date. His toe hurts. And he didn't get the money."

Nick was enjoying himself. He had the telephone receiver held at arm's length. He brought the mouthpiece closer and muffled his voice with his hand.

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"I'm having a devil of a time hearing you. Maybe you should call back on another line."

"All right. I will do just that."

Nick hung up the phone and walked out the door. Behind him the phone began to ring.

Chapter 8

The Sun had almost broken through the smog as Nick drove. A police car overtook him and flashed past with its siren on. Not five seconds later, another police car flashed past, siren on, going the *opposite* direction.

Nick drove through a neighborhood so poor that all the houses had satellite dishes in the *front* yards.

Nick was on schedule when he pulled into the restaurant parking lot. In a car next to the drive-in speaker, a customer screamed, "Burger and fries!"

From the speaker grill came a heavily garbled, "What?"

The customer burned rubber leaving the drive-in window.

Nick parked well away from the drive-in exit and went inside.

He was examining the menu on the table when a disturbing shadow fell over the table top. The shadow seemed to be a person with a gun in one hand. Nick flinched. He looked up and saw Annette with her handbag. The gun shadow had just been a trick of the light. Annette's gaze took in the shadow and Nick's reaction. She maneuvered her fingers and made a shadow of an AK-47 assault rifle.

Annette said, "I had to go this same way, so I thought I'd join you. Is that all right?"

"It's still a free country." Nick traced a line with one finger on the counter top. "And I suppose company wouldn't hurt. These fast food places always seem so sterile to me."

Behind Nick a waiter dropped a sandwich on the floor, picked it up, dusted it off, and continued nonchalantly on his way.

Annette looked at the menu. "I know what you mean. It's like you could eat off the floor."

"You know what you want?"

Annette looked at Nick just a little too long before she glanced back at the menu. "Sure. Do you?"

"Yeah." Nick pressed a button near the speaker grill. He wondered if Annette's hesitation might have meant she had some second thoughts about leaving him. They had argued more than he had liked, but when things were going smoothly he had felt more comfortable than he ever had, before or after. He said nothing, and tried to suppress the thoughts. Why torment himself? Probably she had just been deciding between the Golden Bun and the Biggie Burgie.

A moment later the order taker replied in a voice garbled almost beyond recognition. "Are you ready to order?"

"Yes. We'd like one—" he looked where Annette pointed on the menu "—number twelve and a coffee. And one number eight and a glass of water."

The order taker hesitated. "What?"

Nick faced the microphone and spoke slowly. "One number twelve and a coffee. And one number eight and a glass of water."

"What?"

Nick sighed. "Never mind." To Annette he said, "I'll be back."

Nick rolled up his sleeves and rose.

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He walked back to the counter where a sign said, "Manual Orders." There was a line.

A few minutes later, Nick carried a tray back to the table. As he passed a teenager at the serve-yourself drink refill station, the machine shot a couple of ice cubes in an arc. The teenager backed up, trying to catch them in the cup, and ran into a restaurant employee carrying a large stack of trays. The employee was knocked off balance. He staggered toward a nearby swinging door, struggling to keep the trays from falling. Just as everything appeared under control, another employee came through the swinging doors fast enough to knock the trays over. The trays fell and spread out over half the area of the floor.

A customer at an automatic coffee dispenser paid no attention to the clatter, but instead stared at the brown sludge oozing into his cup.

Nick reached the table and sat down. "All taken care of. This sure is a noisy place."

"A lot noisier than some South Seas island would be, huh?"

"Oh, the poster in my office?"

"Yes. I take it you'd rather be there?"

"What, rather be in my office?" Nick asked. "No, I know you mean on an island. There are times when the idea's really appealing. I've started to have this recurring dream about a sailboat in water so clean you can put your hand in it."

"That does sound nice." Annette inspected her meal. "Where did we go wrong, Nick?"

"I really wish I knew." He looked at her, but she wouldn't meet his gaze.

From the speaker at a nearby table the order taker's loud voice said, "What?" The person at that table got up and started toward the manual order counter.

Dusk was coming on as Nick and Annette exited the restaurant. The Sun no longer had the energy to punch through smog, but it made a brownish-yellow glow in the west.

"We could just take my car to your brother's house," Nick said.

"Sure."

Nick walked in silence, irritated at himself for letting his mind drift to the way things had been before she walked out.

Nick tried his key in the lock, but it didn't work. He frowned and looked up.

He had stopped at the wrong car. This one, although the identical model, belonged to someone else. His car was right next to it.

After opening the right door, Nick held it for Annette, then walked around to his side. The engine started smoothly.

The breathy car voice said, "Your headlights are off."

Nick turned on the headlights.

"You're low on gas."

Nick tapped the digital gauge.

"So. Who's the bimbo?"

Annette gave Nick a slow, hard stare.

Moments after they had driven away, the owner of the car next to Nick's returned. He got in and turned his key in the ignition. The engine didn't start, but instead the car began to fill with blue slime. The man banged on the car door and windows, but he couldn't get out.

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* * *

Chapter 9

Nick finished pumping gas, and pulled out the self-serve pump nozzle. The price per gallon on the pump read $7.50, and he had put over $200 into the car. As Nick hung up the nozzle, he thumped the gas pump dial, and it dropped to $150.

He put the gas cap back on as the car voice belched. "Excuse me."

Nick shook his head and fed his credit card into the machine next to the pump.

Two stations down from Nick, a young guy with a digital watch pumped gas into a General Nippon Tracer. His watch beeped, and he reflexively pulled his arm toward him, pumping gas all over himself in the process.

Nick got back in the car and drove off. Ten seconds later, a van pulled through in his wake. Driving the van was the tattooed strong guy who had been after Annette. As he began to accelerate after Nick, the driver flipped a lit cigarette out his window. From behind him came a *whoomp!* Dazzling light reflected off the shiny surfaces, and from somewhere in the brilliance came a startled *Yelp!*

Street lights were lit as Nick and Annette traveled along a residential street. Darkness had brought little relief from the heat.

Annette took a deep breath. "What a beautiful night."

Down a side street, a car careened out of control.

The car said, "It's thirty-one degrees Celsius."

Nick looked over at Annette. "Yeah, it sure is."

"A light wind is out of the southwest," said the car.

Annette raised her eyebrows. "Am I imagining things, or does your car seem a little jealous?"

"An automobile? Don't be silly."

The car said, "That's telling her, Nick."

Nick and Annette pulled up near Ed Taylor's house. Nick couldn't park directly in front of the house because the automatic, overwatering-proof sprinkler system was busily spraying the street. Not a drop was going on the grass. Nick and Annette got out and started up the driveway.

Annette said, "I should be able to get us by the security system. I made arrangements for their son to stay with friends until Carla gets out of the hospital or we find Ed."

"Probably not in that order."

A lighted panel next to the front door held a keypad. Above it was a speaker grille for the voice-operated house-security system.

"Hello," said the gravel-voiced security system.

"Hello," said Annette. To Nick, she said, "First you have to key in the right sequence. Then it will ask for a password." She typed in a five-digit number.

The security system said, "Sorry. Try it again."

Annette looked puzzled. She tried the number again.

"No. Try it again." The security system sounded testy.

Annette tried the number again.

Irritated this time, the security system said, "Come on. Try it again."

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Annette tried the number again.

"Give me a bugging break! It's five eight five one four."

Annette tried the new number.

"Very good! Now what's the blasted password?"

Annette whispered, "Film at eleven."

"What?"

Annette raised her voice slightly. "Film at eleven."

"What?"

Annette looked flustered at the idea of yelling the secret password into the quiet night air. She looked around.

Nick nudged her aside and hit his flattened palm hard against the speaker grille.

"Welcome!" said the security system. The door latch clicked and the door swung open.

Nick and Annette walked slowly into the dark foyer.

"I just had a thought," Nick said. "They don't have a dog, do they?"

"No. Just a cat."

Even while Annette spoke, the cat cried out as Nick stepped on its tail.

By the time Annette flicked on a light switch, the cat had already scampered to safety.

They walked cautiously into the tidy kitchen and flipped on the light switch. A sudden *whir* from a blender near the sink came on with the light.

Nick flipped the light off. The blender went off.

Nick flipped the light on. The blender *whir* started again.

Nick and Annette relaxed a little. Nick went over to the blender. He turned it off and simultaneously the toaster ejected two burned pieces of toast.

In the living room, Annette flipped on the light switch. At the phone answerer, Nick paused and pushed the button.

"Four messages," the answerer said.

Beep.

"Hey, Alex, this is Richard. I've got a problem with number eight on the geometry homework. When you worked it out, how many angels did you think could dance on the head of a pin?"

Beep.

"Mr. Taylor, this is Michelle Clark at the library. I've had to reshelve the computer books you've been working with. If you need them again, just ask."

Beep.

"Alex, I just wanted to remind you to do your homework. I'll be home soon. Love, Mom."

Beep.

"Alex, I just wanted to remind you to do your homework. I'll be home soon. Love, Mom."

Nick shook his head.

Nick and Annette moved into another room and approached a table covered with computer equipment, including a modem and a telephone. The computer was off.

Nick said, "This looks like an expensive collection of equipment."

"He's serious about his hobby."

They searched the stacks of printouts on the table, finding nothing that looked like it could help.

As they continued the search in another room, Annette said, "I've heard Ed talk about a wall safe. I wonder where it might be."

"We could try there." Nick pointed at a wall adorned with several small paintings. All but one were reasonably

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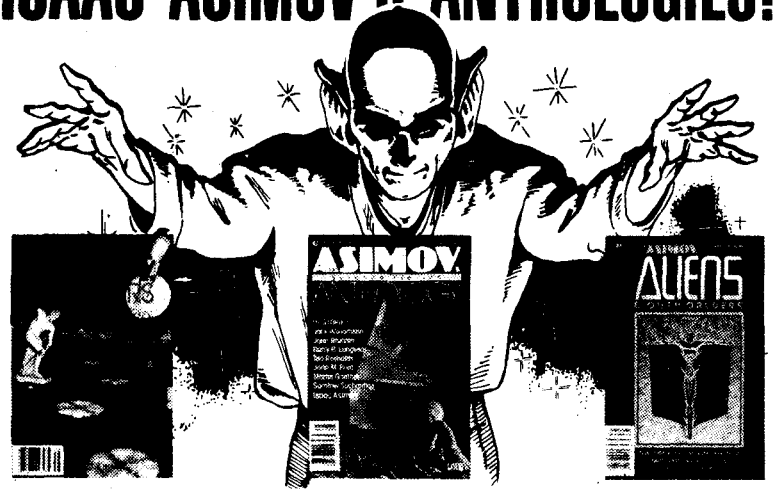

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positioned. The odd one was over-large. It hung right in the upper corner of the room and featured a picture of a wall safe.

They swung the picture aside and exposed a *wall safe!*

"Well, well," Nick said. "What do we have here?"

"A wall safe," the safe said.

Nick turned to Annette. "Any idea of the combination?"

"Sorry," she said.

"What's your brother's birthday?"

"July 30, 1975."

Nick tried 7-30-75.

"Sorry," said the safe. "Try again."

Nick said, "What's Carla's birthday?"

"Uh, March 26, same year."

Nick tried the new combination.

"Missed it by *that* much," the safe said.

"Which number was wrong?"

"You don't think I'm so stupid that I'm going to tell you the combination is seventy-five, three, twenty-six do you?"

Nick and Annette grinned at each other. Nick tried the new combination and the safe opened.

Nick pulled out the contents. The safe contained nothing but issues of 1990s comic books. "Mom isn't going to throw these babies out, huh?"

In the kitchen on the way out, Annette said, "I can't believe it. We couldn't even find the cat. And we know *it's* here."

"Maybe we can learn something at the library. And forget the cat. I'm sure it's just fine."

They moved into the foyer and turned out the light. As they walked the two feet to the front door, something slid under Nick's foot, and the cat cried out again.

Nick and Annette pulled away from the Taylor house. The sprinkler was still watering the street. Little sensors stuck into the soil were undoubtedly sending the message that the lawn hadn't had enough water yet.

In the distance, an engine started up and headlights flicked on. The van from the gas station reversed direction and started to follow, but just as the van was going in the right direction, a dog walked into the street and sat down right in front of the van's headlights.

The van stopped suddenly, and the driver honked the horn. The dog stayed right where it was.

Chapter 10

Nick passed a parked police car.

Only seconds later, the police car came to life, lights on, engine racing, and it started to follow. Its siren came on.

Nick's car said, "Fuzz at six o'clock."

Nick looked in the rearview mirror and saw the flashing lights. "What now?" He looked at Annette and pulled over.

The police car stopped three car lengths back.

The cop driving got out of his door, and crouched behind it, gun drawn.

The second cop looked over from the passenger seat. He finished munching a donut and threw the box in the back seat with the rest of the boxes. He looked over at his partner and said, "You know, he can still shoot your feet." He licked his fingers.

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The first cop climbed back in the car and angled his gun out the window awkwardly. "This is the police. Get out of the car. Lean against it with your hands spread."

Nick and Annette opened their respective doors and got out. They leaned against Nick's car, hands spread obediently.

The cops cautiously approached, weapons drawn. One cop covered each of them.

"I need to see your driver's license, sir," the first cop said.

"It's in my wallet in my back pocket. What's this all about, officer?"

"Our database shows your car as a stolen vehicle. Suspects armed and dangerous. The database said to shoot on sight, so don't test your luck."

"There's got to be some mistake. Does she look dangerous to you?" Nick hesitated. "OK, don't answer that."

The cop retrieved the wallet, and looked at the license. "Just a minute, please." He gestured for the other cop to cover them both while he went back to their car to use the police radio.

He picked up the mike, then rubbed it on his pants leg to remove the donut sugar. "This is car fifty-four. We've got a ten twenty-six here. I need a ten twenty-eight on a Mr. Nick Naught."

A voice came over the air from headquarters, heavily garbled. "What?"

"I said this is car fifty-four. We've got a ten twenty-six here. I need a ten twenty-eight on a Nick Naught."

"What?"

"I have a suspect in custody. I need vehicle registration information on a Nick Naught."

"Why didn't you say so?"

As Nick leaned against the car, he wondered if he knew anyone who would pull a practical joke like this, or if the police database really was that messed up.

Moments later the cop returned from the police car. "All right, you two. You can stand up straight. Goddamn database."

Nick and Annette glanced at each other and relaxed.

The cop wrote out a ticket and handed it to Nick along with his wallet.

"What's this?" Nick asked.

"A ticket. Your driver's license expired last week."

The library parking lot was mostly empty by the time Nick and Annette parked and started walking toward the entrance.

"What a day," Nick said. He rubbed the back of his neck.

"It's been like this all day?"

"What a year."

Nick held back at the turnstile inside to let Annette go first. As she passed through the turnstile, it popped into the next rotation so quickly that it snapped her on the rear.

Annette looked back suspiciously, and Nick spread his hands in an "I'm innocent" gesture.

The reference section was as quiet as the parking lot. Nick looked for the computer books, while Annette took a detour to talk to a librarian.

Minutes later, Annette found Nick trying to decide what to look at first. She said, "Here's the list of the books he had checked out. What are we looking for?"

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"I don't know," Nick said. "Dog-eared pages, underlining, whatever."

They opened book after book. Nick pulled an issue of *Mad Magazine* off the shelf, puzzled by its presence there, and put it back.

"Nick, look at this." Annette held a book, inside which were almost a dozen sheets of paper, each with apparently random sets of widely spaced letters on them.

Nick said, "Looks like a clue to me. But what do you make of it?"

"No idea."

A pronounced footfall sounded in the otherwise silent library.

"Let's get out of here," Nick said. "That can't be the cat."

On the way out, Nick again let Annette go first through the turnstile. This time, the turnstile operated normally, but Nick indulged an impulse and patted her on the rear.

Annette looked around quickly, and Nick spread his hands in the "I'm innocent" gesture. He pointed at the turnstile.

Nick walked two more steps before he saw a turnstile reflection in a glass door, and realized Annette must have been able to see him then. He slapped his palm against his forehead.

As they exited the library, Annette had a wry smile on her lips.

From the distance came the sound of a siren. Another noise, a softer sound, accompanied the siren, but it took Nick a second to realize where it was coming from. He grabbed Annette's hand and pulled her along, just as an incoming whistle increased in volume, and a baby grand piano crashed to the ground exactly where they had stood seconds earlier. Sheet music fluttered away in the breeze.

"Holy Scheherazade!" Nick said, looking at the rubble.

"Oh, my God!"

"You have any enemies in the L.A. Philharmonic?"

"No."

"Well, we missed death by piano by that much. Let's get out of here."

After they were safely in the car and a block away, Annette said, "No chance that was an accident?"

"Maybe with an upright, but a baby grand? No way."

Nick let Annette out next to her car in the restaurant parking lot. "I can follow you to wherever you're staying, just in case," he said. "Somehow they followed us there."

"I'm staying at the Red Moon Inn, but I'll be all right. You take care of yourself."

"Right. I'll call you tomorrow. And, Annette—you be careful, too. I don't want anything to happen to you."

Annette reached over and touched Nick's hand. Tenderly she said, "Me, neither."

As Nick watched her tail lights recede, he sighed. He didn't turn to get into his car until the tiny red lights were lost in the smog.

Chapter 11

The elevator in Nick's apartment building was silent except for a soft hiss of ventilation. Nick leaned against the wall and watched the floor indicator rise to his floor. The elevator stopped.

For a long moment the doors re-

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mained closed. The ventilation hiss seemed to increase in volume.

"You going to open the doors?" Nick asked finally.

The elevator's voice was ultra-calm. "I'm sorry, Dave. I'm afraid I can't do that."

Nick sighed. "Oh, come on. I'm tired."

The doors opened.

Nick entered his apartment, exhausted. He locked three separate locks on the inside of the door and pressed a button. A panel lit up, saying, "Alarm engaged."

On the living room wall was another large poster of a South Seas island. This one was twice as large as the poster in his bedroom.

Nick turned out the light and stumbled into the bedroom where he crashed onto the bed, clothes still on. It took him only moments to fall asleep.

Approximately an hour later, Nick was sleeping soundly, his breath a series of sighs. A door squeaked softly as it opened, then the sound of muted whispering filtered into the bedroom.

Suddenly a light flashed on, exposing Nick lying on the bed. While Nick was still groggy, a pair of hands grabbed and restrained him while another pair of hands sprayed an aerosol can in his face.

Nick's arms hurt as he woke up uncomfortably. He couldn't see much because of the bright light hanging near his face, but he could see various instruments of torture against the dungeon walls.

He sat in a straight-backed chair, bound with thick ropes.

From the shadows, two business-suited men approached. Both had mean, pinched faces with dark eyes and dark stubble showing. Both wore white shirts.

The taller man said, "You have the right to remain silent—"

"Cut that nonsense," said the other. "You forget who we are?"

"Sorry."

"Mr. Naught, you've caused us a lot of trouble."

"Who the hell are you guys?" Nick demanded.

"We see thousands of people like you every year. You think you're so great, above it all. Well, you're not. And we're going to get what's coming to us, one way or another." The man showed what he had in his hands: a thumbscrew. The taller man brandished a whip.

"Get what?" Nick asked. "What have you got coming?"

"Sure, Mr. Naught. Pretend you don't know. We expected nothing less from you."

"Who the hell *are* you guys, anyway? Just tell me what's going on."

"Oh, go on," said the taller one. "Tell him, Dan."

The other man pulled out his wallet and flipped it open to a badge. "We're the Internal Revenue Service, Mr. Naught. And we're going to get what you owe us, one way or another."

"The IRS? You've got to be kidding me."

"We *never* kid, Mr. Naught. About anything."

Nick looked at the ceiling. "Is this revolting, or what?"

The agents moved closer, menacingly.

Nick said, "Wait a minute. Wait a

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minute. How much do I owe you anyway?"

The taller man looked at his companion. "I don't know. I'd have to look it up."

"Well, do it. We've got all the time in the world."

The IRS agent moved to a computer terminal and punched a few keys. The video terminal made the mechanical sound a huge line printer would make as the screen scrolled.

"It says here on your return from four years ago you illegally rounded your office supplies deductions from $156.24 up to $157. Your check was therefore short by one dollar."

Nick was astonished. He said, "A dollar? One goddamn dollar? I'll give you a goddamn dollar. Let me get to my wallet. I'll give you a goddamn *ten* dollars."

"Bad mistake, Mr. Naught. Never, ever, try to bribe an official of the IRS."

"I'm sorry. I lost my head. Just let me get to my wallet, and I'll give you the dollar. All right?"

The shorter agent asked his partner, "Is there anything in the rules about this?"

"No. I think it's permissible to pay a balance due amount in cash."

"Damn."

The taller agent smiled and said, "As long as you're here, would you care to contribute to the presidential campaign fund?"

The front door to Nick's apartment opened, and Nick was shoved through. He managed to catch his balance without falling on the floor, but he jammed one shin hard into the coffee table, and he winced.

The shorter IRS agent straightened his collar and said, "Just you watch your step, Mr. Naught. You miss another audit, and we'll be on your case. You bleeding-heart long-form scum make me sick."

Chapter 12

In Nick's empty office, the phone rang. The phone answerer clicked on. "Nick Naught Private Investigations. Mr. Naught is sleeping late, so please leave a message."

Beep.

"Are you the Nick Naught who's the cousin of George Bauman? If you are, I've got a very large inheritance for you. Give me a call at 555-1212."

Just as the phone answerer clicked off, Nick entered the office. He pressed a button on the answerer.

"Sorry. No messages," it said.

Nick looked suspicious for a moment. Then he shook his head and said, "Nah."

He picked up the phone and dialed a very long number.

"Hey, Ron," he said when the call was answered. "Nick here. You still owe me a favor."

"Sure. Name it."

"There's a chance that someone's trying to cause a little trouble for me. Would you find out if Mike Johannson is still in the coop? He's the only person I can think of that holds a grudge."

"When do you want the answer?"

"Just leave a message if I'm not here. I've got an errand to run."

Nick stood in line while a bored

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woman license clerk waited on people ahead of him. He wondered which one of them owned the car out front that had been bent over a parking meter.

When he finally reached the head of the line, he said, "I want to renew my license."

"All right. Let me just check this out." The blond clerk ran the license through a slot on the top of her terminal. As she looked at the screen, her dark eyes widened, and she made "tsk tsk" sounds. "It says here you had a moving violation last February."

"Yeah, I did, kind of. You see, I was chasing an escaped murderer."

"It also says here that in the eighth grade you dumped Rita Archibald."

Nick craned his neck to see the screen, but the clerk swiveled it so he couldn't.

She went on. "Since your license has expired, you're going to have to retake the test."

Nick sighed. "God. Not the test again."

Nick walked past a test taker standing at what looked like a voting booth with no privacy curtain. Jumper cables from the machine ran to bands on both of the test-taker's wrists.

The machine asked, "Are parking lights used while your car is in motion?"

"Er—Yes."

Buzz! The test taker convulsed under the electrical shock.

The next station Nick passed was similar.

The machine asked, "Are you *always* supposed to use your turn signals when making turns or changing lanes?"

"Er—No."

Buzz! The test taker convulsed under the electrical shock.

At the third machine the test taker wore flowing robes and a pointed hat.

The machine asked, "At the present rate of population growth, by the year 2050 we will have only one square foot of land area per person. Does that make you want to reevaluate your stance on birth control?"

"Er—No."

Buzz! The test taker convulsed under the electrical shock.

Nick stood at a testing station with the jumper cables from the testing machine hanging from his wrists.

The machine asked, "What is the capitol of West Virginia?"

"Er—I don't know."

Buzz! Nick turned around casually to see if anyone was watching. The jumper cable on his right wrist hung from the shirt sleeve instead of from the strap on his wrist.

Nick sat before the camera. He brought up his hand to deal with an irresistible itch on his nose, and the flash went off.

"Next!" called the photographer before he laughed.

Chapter 13

Back in his office, Nick pressed the button on the phone answerer.

"Two messages waiting." *Beep.*

The first caller said, "I saw that article about how you saved that old man who was about to get hit by a car. Well, that old man was my inheritance money. So now I'm stuck here that much longer. I think you stink."

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Beep.

The second message was Nick's voice. "Ah, this is me. Just testing."

Nick raised his eyebrows, surprised that the messages got through.

The phone rang, and he picked it up. He opened his mouth as if to talk but didn't say anything. The phone answerer remained silent. "Hello," he said finally.

"Nick, Ron. I just ran a check on Mike Johannson. He's still in Leavenworth, but he just has a couple of months left on his year. He was only in for those murders."

"Thanks for checking. I guess I must have been wrong."

"Sorry not to be more help. Now we're even, right?"

"Right. Thanks." Nick hung up.

The phone rang again. Nick picked it up, waited a second before saying, "Nick Naught."

"Hello. I'm calling from the air freight desk at the airport. We've got a package here for you to pick up."

"All right. I wasn't expecting anything, but I'll be out to get it."

Nick hung up, then picked up the phone and dialed a long number. "Can I speak to Annette Taylor?" he asked when the call was completed. As he waited, he picked the clock out of the trash can. It still said 2:30 A.M. He dropped it back in.

"Hello," Annette said.

"This is Nick. I think we need to get back together and—ah—get caught up on paperwork."

"I agree. What's a good time for you?"

"Maybe in a couple of hours. I've got to go out to the airport."

"Why don't I join you?"

"Fine. Pick you up in twenty minutes?"

"OK."

Nick hung up. He started out of the office, but the phone rang again. He picked it up. "Nick Naught."

The phone answerer started up. "Nick Naught Private—"

"I'm *on* the line," said Nick

"You don't have to be so testy," said the answerer.

"Mr. Naught, G. David Chamness here. You're a hard man to get hold of. I tried to get back to you yesterday, but the phone system just wouldn't cooperate."

"Yeah, I know what you mean. Say, *could I put you on hold for just a moment?*"

"Well, I suppose I would have to say that would be acceptable."

The auto-translator screen said, "Yes."

"Thanks," Nick said. He put the receiver back on the hook and walked out the door.

The airport was busy as Nick and Annette walked toward the entrance. The whine from a huge airliner taking off suddenly shifted in pitch and volume as it had to avoid a second plane.

Annette wore a tan skirt. Over her shoulder, hung a large purse on a long strap. "You OK?" she asked. "You seem a little tired."

"Yeah, I'm fine. I just had a nightmare last night."

Annette raised her eyebrows, but said nothing.

Near the doors was a newspaper vending machine.

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"Yo! Wanna buy a paper?" it called.

Nick ignored it.

"Paper, man? Lady?"

Nick ignored it some more.

"Hey, I'm *talkin'* to you, mofo!"

Nick and Annette reached the sliding glass doors and found a middle-aged woman having trouble. She approached the open doors, and the doors promptly closed.

The woman backed up, and the doors opened.

She came closer. The doors closed.

The woman backed up. The doors opened.

Nick touched the woman's arm. "I think I've got this figured out. Can you stay here for just a moment?"

The woman nodded.

Nick took a running start and sped toward the gap between the doors. The doors started to close as they sensed him coming, but he managed to barely beat them as they pounded together hard enough to crush carbon into diamonds. As soon as he was through, they opened again.

Nick stayed far enough from the doors for them to stay open, and he gestured to Annette.

She imitated him, and got a running start. She sped through the doors safely, but this time when they pounded closed, they caught some material at the back of her skirt, and she was stuck.

Nick approached and saw what had happened. He gave a quick, hard pull on the material stuck in the door.

Rip.

"Sorry about that," Nick said.

As they walked away from the doors, Annette tried to see how much damage was done. Her skirt was missing a narrow vertical strip. Once they got far enough away, the doors opened once again.

Seconds later, the sudden sound of a horrendous crash reminded Nick about the older woman trying to get through. She screamed as Nick looked back and grimaced.

Occasionally, as Nick and Annette walked, an airport P.A. system announcement sounded. Without exception the voices were all totally garbled.

They passed an attractive young woman of Japanese descent wearing a T-shirt that said, "Made in Japan," as a man on a motorized cart sped past fast enough for them to hear the Doppler shift.

They passed another newspaper vending machine, this one selling the *Bermuda Triangle Inquirer*. It gave a loud wolf whistle. Annette looked around, saw no one, but clutched the torn material at her back.

Nick said, "Just a minute. I've got an idea."

Moments later, he returned with an electric cart, and Annette joined him.

The air freight counter had no one waiting in line.

"Here you are, sir," said the clerk. "Can I get you to sign for it?"

"Sure," Nick said.

The package was about the size of a paperback book, securely sealed with strong tape. Nick tried to open it, but his fingernails weren't sharp enough. He looked at the return address without recognizing it. He put the package in his jacket pocket and got back on the cart with Annette.

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Threading through the crowd on the way back, they passed a woman who had set up a small table bearing the sign, "Citizens for Clean Books."

Nick swerved close enough to be heard and said, "So. Burned any good books lately?"

He heard no reaction from Annette, and he realized she had been fairly quiet for the past few minutes. He looked over at her questioningly.

Annette said, "You know, I must have thought about calling you a thousand times. Pretty masochistic, huh?"

Nick looked at the pedestrians ahead. "I wish you'd have called at least once. So I knew you were all right. I had to find out from Diana that you were still in town."

"Why should you care what happened to me? You deserted me."

They passed a teenage girl trying to get a drink from the water fountain. She pressed the button and water splattered all over her face. She gave it a second try, keeping her head clear. A jet of water flew twenty feet through the air and doused the newspaper being read by a seated man.

Nick frowned and said, "What the hell are you talking about? You're the one who walked out on me."

"The hell I did! You walked out of the apartment that day and you didn't come back. I waited two weeks and decided you were never coming back so I moved in with Diana."

"I was in the hospital for Pete's sake! I called and left you five messages on the answering machine."

Annette looked uncertain. "You did? I never got them." More firmly she added, "Besides, I left *you* a bunch of messages on the answerer. You could have called me."

Nick said slowly, "I never got any messages. After all those fights I figured you'd had enough. I mean we had both threatened to move out, and I guess I decided your threats had actually been serious."

As they continued in silence, and Nick's stomach churned madly, they passed by the tattooed van driver, who smiled broadly when he saw Annette. The man began to run after Nick's cart, but changed his mind. He altered his course and raced toward an occupied cart, where he knocked the rider off, spilling the contents of the rider's shopping bag in a heap.

Nick and Annette passed a customer standing in front of a coffee machine. The cup didn't drop into the slot, so the coffee just flowed into the drain.

Annette finally said, "You really left mes—"

Nick started speaking simultaneously. "You didn't really walk—"

From behind them came a *yelp*, and Annette looked back. She saw the van driver on a cart that had just knocked over a kid. "Nick! Step on it! We're being followed by one of the guys who tried to kidnap me. If he has that knockout stuff they used on Ed—"

Nick looked back, then started to accelerate. Their cart sped faster, darting into holes that opened in the crowd.

The van driver followed in his cart, gaining because Nick's cart opened holes for both of the carts. The driver knocked a matronly lady sprawling. From a seated position, she turned, and, for someone who looked as refined as

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she did, gave the man a surprisingly rude gesture.

Suddenly, a man tall enough to be a formidable basketball player, riding another cart, appeared right in front of the van driver's cart, and the two carts crashed.

"Watch where you're going!" shouted the van driver.

"Why don't you?" said the jock. "I had the right of way!"

"And how do you figure that, toad face?"

Nick looked back and saw the confrontation interrupted by an approaching siren. The two cart drivers looked irritated when a third cart pulled up. This one spotted red and blue flashing lights and was driven by a cart cop, a potbellied man wearing sunglasses and a hat. The cart logo said "L.A.X.P.D."

The cart cop got off his cart as the two drivers sat transfixed. The cart cop came over to the van driver's cart and rested one foot on the fender. "Looks like we've got a heap of trouble here, boys."

The jock said, "This idiot ran right into my side."

The van driver said, "Yeah, well, this idiot was going too fast."

The cart cop pulled out a pad of tickets and began to write. "Well, it looks like we got us a 'doin' ten in a five zone,' a 'drivin' without seat belts,' and a 'failure to yield right of way' just for starts. Lemme see your licenses." He hesitated. "You fellas insured for this?"

Nick circled the accident scene and came up behind the crashed carts. He drove slowly past the confrontation.

"That's the one who was driving the van," Annette said softly. "I'm absolutely certain of it."

Nick raised his voice and pointed to the van driver. "That's the guy, Officer. Back there a ways we passed a woman who was running to catch up with this guy. Apparently he was trying to molest her son in the rest room."

As Nick accelerated away, the van driver glared murderously, and the cart cop began to smile.

Nick and Annette were both silent in thought as they passed a newsstand where a man was reading a copy of *Digital Science Fiction*.

They rolled through the baggage claim area as the conveyor spewed pieces of luggage, most of which were smoking, falling open, and gashed.

The main doors were still malfunctioning when they got back. One door now had a big hole in the glass.

As they watched, a husky guy who looked like he played a lot of football tried the same trick Nick and Annette had used to get in. He ran, but he wasn't quite fast enough, and the doors clamped shut, catching him and trapping him between them. He dropped his bag, and it slid a couple of feet before it stopped.

As muscles stood out in cords on his arms, he pushed the doors slowly apart.

Nick said, "What do you want to bet his luggage is Samsonite?"

As the man stood there, struggling against the pressure, obviously wanting to jump aside and let the doors snap shut, three people used the opportunity to get through the door. The last one turned around and took the beefy guy's wallet from his back pocket.

The guy lasted another couple of seconds, then jumped away and let the

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doors snap shut. He grabbed his luggage and began to run fast, obviously looking for another door out, so he could track down his wallet. The doors opened.

Nick looked at the doors a moment. Since no one else was near them, the doors stayed open. Nick walked over and pulled out the wall-plug. A second later, a guy in a jogging outfit raced through the open doors. The doors made no move to close. The jogger realized they hadn't reacted, and he moved slowly closer to investigate. He moved still closer to the doors, wary of being caught by them. As Nick and Annette moved past him, Nick touched the guy's arm, and the guy jumped.

Innocently Nick said, "What's the problem?"

Outside, the newspaper vending machine said, "Cheapskate!"

Nick hesitated, glanced around to see if anyone was looking, then pulled his gun and walked over to the vending machine.

"Er, nice day, isn't it?" said the machine.

Chapter 14

Nick and Annette rode without speaking for the first few minutes in the car. A light rain was falling, so the windshield wipers were on. The radio played rock music, and the wipers moved from side to side in perfect step with the music beat. The car hit a bump, and the station switched to classical. The wipers slowed down to match the tempo of the classical music. Annette banged the dash, and the station changed back to rock. The wipers sped up again to match the rock beat.

They drove past a parking lot with the sign in front, "Soon, a new office building on this spot. Your tax dollars at work."

A block later, they passed an office building with the sign that read, "Soon, a new parking lot on this spot. Your tax dollars at work."

Annette finally asked, "Have you ever seen the guy who was chasing us in the airport?"

"Nope. But if anyone else tries to follow us, I'll spot him."

Three car lengths behind, was a van following Nick's car. On the dash, a light blinked, as though the driver was tracking the car ahead. The van driver was Dennis Cotton, the red-nosed man who had nearly killed Nick in front of the hospital.

Nick and Annette passed through the rain, and the Sun started coming out. They drove by a theater with the marquee sign saying, *Aliens 9 — In Space No One Can Hear You Vomit.*

A police car flashed past, lights and siren on.

Nick took the package out of his coat pocket and handed it to Annette. "You got anything to open this with?"

"Maybe." Annette opened her purse and glanced through it. She looked back at the package and frowned. "What is it?"

"No idea."

The driver of the van behind them flipped open a compartment on the dash. He pressed a button. Numbers started to count down from thirty.

Annette said, "You get stuff you can't identify very often?"

"No. Not really. Why? Are you suggesting—"

"Maybe I'm just paranoid."

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The numbers on the panel in the van kept counting down.

Nick said, "You know, this is starting to bother me a whole lot."

"It's about time."

The digits got down to five and suddenly started repeating. *Five. Five. Five . . .* The van driver noticed and pounded on the box.

Nick shouted, "Let's get rid of it!"

"Right!"

Nick tried to roll down his power window. Nothing happened. "It's stuck!"

Annette tried her window control. Nothing happened. "Mine, too!"

The van driver banged on the box again.

Nick and Annette simultaneously hit their car doors, and both windows started down. Nick threw the package up and out, arcing it into the road behind them.

The numbers on the van driver's box finally resumed their count. *Four. Three.*

"Finally!" the driver said. He looked back at the road, and was just realizing something lay on the pavement ahead when the numbers reached *One.*

He cried out and yanked the wheel as the counter reached *Zero,* and the small bomb exploded right under his van. Two tires instantly blew, and the back of the van nearly disintegrated. The driver lost control and crashed at the side of the road.

Nick watched in the rearview mirror. "I've seen that van before. I'm sure of it."

"Let's get out of here," Annette said.

At Dennis's van, the smoke began to clear. Dennis struggled upright, opened the door, and fell out, mashing his already hurt shoulder. "I hate this goddamn job!"

At the sound of an approaching siren, Dennis looked hopeful. The ambulance pulled even with his van, without slowing down, and sped away, going wherever it was already going.

Annette frowned. "That bomb was meant for us, you realize that?"

"I sure do." Nick turned a corner. "You might even say it had my name on it."

"I'm not joking! Someone just tried to kill us."

"Not to mention me," said the car.

They passed a huge building with an animated sign saying, "Hackers's Military Secrets."

Nick hesitated. "I'm sorry. I guess I'm a little punchy and confused. It's like whoever's after you is psychotic. One time they try to kidnap you, the next time they try to kill you. And that package could easily have just gotten me without hurting you."

"Well, what do we do?"

A police car flashed past, siren on.

"Well, we could call the police."

They passed a stalled car with its hood open. A man in a business suit was bent over the engine compartment, working on it. A black, ugly part of the engine flew out of the engine compartment and bounced on the ground several yards away.

Annette shook her head. "We should live so long. That desert island of yours is looking better and better all the time."

Nick checked the rearview mirror. "First things first. We've got to work fast and get this figured out. And I've got an idea."

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Chapter 15

Nick and Annette pulled up in front of KSMY in Nick's car. Nick squeezed into a parking space and killed the engine.

The car said, "Can I come, too?"

Nick raised his eyebrows. "Wait here, will you? You can listen to the radio."

While Nick and Annette waited in the lobby, Connie and Howard were live on the TV monitor. Howard moved to a new story. "In a bizarre shoot-out at the Beverly Hilton this morning, the last surviving Blood and the last surviving Crip killed each other."

Connie took her turn. "On a bitter note, four young moviegoers were gunned down in a multiplex theater last night. Larry Costa is in custody after a group of survivors kept him at bay for six hours until the police arrived. The feature was last year's remake of *Old Yeller*. Allegedly, at an intensely emotional and very quiet point in the film, the four victims' hourly watch chimes went off."

A door opened and Earle Thompson came in. "Sorry to keep you waiting. Come on in."

"Thanks," Nick said.

Nick introduced Annette as they walked down the hall. They passed Curtis's closed office door, and Nick could hear the buzzer.

At the end of the corridor, Earle pointed into a room off the hallway. "There you are. Help yourselves."

Nick thanked him, and Earle went back to work.

The small room contained two photocopiers. On the wall was a framed photocopy labeled, "Posterior of the Month."

Nick turned to Annette. "Let's see those papers."

She got the stack of papers from her purse and handed the sheets to him.

Nick put an original on the glass of the first copier. "One copy."

The copier said, "OK." Light flashed, the mechanism whirred, and a totally blank page fell into the hopper.

"Darker," Nick said. "One copy."

"OK." The copier worked and a totally black page came out.

Nick frowned. "You got anything in between?"

The copier flashed, and a half-white, half-black page came out.

Nick sighed. He pulled up the cover to get the original back, but the paper was gone. "Where the hell's my paper?" Nick kicked the machine, and it spit out the original.

"Can't take a joke, huh?" the copier said.

Nick shook his head, moved to the second copier, and put in the original. "One copy."

The copier mechanism did nothing, but it said, "Take a hike. I saw what you did to Tommy."

Nick hesitated. "I'm going to count to three. If you're not running by then, I'm going to take—" He glanced at the first copier. "Tommy—apart piece by piece. And then I'm going to replace him with a different model."

After a short silence the copier said, "*What* model?"

Instantly the first copier said, "Dickie, you jerk!"

"Just kidding," said the second cop-

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ier. Its light flashed, the mechanism whirred, and a good copy came out.

"That's more like it," Nick said. He fed the copy back into the blank paper tray and put the second original on the glass. "One copy."

The copier worked properly again. The ejected copy looked denser because it had letters from both pages on it. Nick again put the copy in the blank paper bin and inserted the third original. The next copy contained partial words. Moments later, the final cycle completed and a full-looking page of text came out.

Nick and Annette examined the completed text.

Nick frowned. "I don't understand. This makes it seem like Ed's been using a computer virus to steal from someone."

"Ed wouldn't do anything like that. There's got to be some mistake."

"Maybe we should go back to the house and look at his computer more closely."

Annette shrugged.

On their way out, they again passed the closed door to Jim Curtis's office, and the buzzer was still going.

Nick stopped, glanced around, and kicked the door once with the side of his shoe. The buzzer stopped. Nick grinned.

Annette had stopped when Nick did. She looked puzzled, but Nick was already moving again.

Outside, a "while you were out" note stuck under Nick's windshield wiper fluttered in the breeze.

Nick read the note aloud. "We've got Ed Taylor. If you want to talk to him, be at Knowlton's Repair Works at ten tonight." He glanced around but saw no one who looked like an obvious candidate for having left the note.

"Nick, that sounds like a trap," Annette said as they got into the car. She had to raise her voice until Nick turned down the volume on the radio.

"Sure it does. I watch movies, too. But *they* are going to be there, whoever they are. This might be the only way to find out what's going on."

As Nick pulled out into the street, they passed a man taking a sledgehammer to his car.

Annette looked over at Nick and said resolutely, "Well, Ed's my brother, so I'm going, too."

"No way. It would be too dangerous."

The car said, "Oh, come on, Nick. What's the harm?"

Chapter 16

Nick's car cruised slowly down the dark, rain-slick street as the windshield wiper kept clearing the drizzle. The neighborhood did not look affluent. Warehouses with broken windows lined the street, and half of the street lights were burned out.

Nick pointed. "Isn't that it over there?"

A flash of lightning illuminated the dark street and the sign, "Knowlton's Repair Works." Thunder echoed.

"Yeah," Annette said. "It looks creepy."

"We're early, but I'd better go in now anyway." Lightning flashed, and loud thunder sounded.

"Well, creepy or not, I'm coming."

"I still think you should wait in the car." Just as Nick spoke, lightning flashed, and thunder crashed again.

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"Not on your life," said Annette.

"It's *your* life I'm—" As he spoke, lightning flashed, and thunder boomed again, and Nick realized the same thing had happened the last several times he spoke. "What a coincidence—" More lightning and thunder.

Nick said, "Every time I say something—" More lightning and thunder.

"Hey, this is fun." More lightning and thunder.

Annette and the car spoke simultaneously. "Men!"

Chapter 17

Nick and Annette dashed across the dark street in the rain, amid the thunder and lightning, trying to avoid the deepest oily puddles.

The door squeaked loudly as they entered the warehouse. The interior was poorly lit by naked light bulbs that revealed a freight elevator ahead of them. Old packing boxes filled to overflowing with trash littered the room.

They walked forward cautiously, seeing no one. Grit crunched beneath their shoes. Nick could smell dust. They followed a path through the boxes that led toward the elevator. Stuck to the elevator cage was a note, which Nick grabbed. "All it says is 'fourth floor,' " he whispered.

Annette whispered back, "The idea of going up in that thing makes me nervous."

"Me, too. That's what they'll be expecting." Through the walls, thunder rumbled. Nick whispered to the freight elevator, "Go to the fourth floor."

"You talkin' to me?" The voice used for the elevator had a Bronx accent.

"Shhh. Yes."

"What?"

Nick slapped his palm against his forehead. "Go to the fourth floor."

"By myself?" asked the elevator.

"Yes."

"Why should I do that?"

"Because I told you to. Because of the second law of robotics."

"Say what?"

"Just do it, will you?"

"Gimme ten bucks?"

"What?"

Suddenly Annette said softly but emphatically, "Go up to the fourth floor, or I'll cut your cable off."

Silently the elevator started to rise.

Nick looked at Annette incredulously.

"I used to have a temperamental microwave," she said.

Nick shook his head. "We'd better find the stairs."

They saw two stairwells each about thirty yards away on opposite sides of the building. Nick pointed to one and they walked as softly as they could toward it. The one Nick chose was even darker than the room they had walked through. Nick drew his gun as he led the way up the dark stairwell. "Shhh."

Only two seconds later, Nick stepped on a squeaky dog's toy. They both jumped. Nick's heart began to slow down, and he picked up the toy.

"Great work," said Annette. "Do you think they have a dog?"

"Pets in a place like this?" Nick tossed the toy away and moved up a step. A cat cried loudly, and something moved under Nick's foot. From the darkness came a diminishing *pitter-patter* sound.

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Annette said dryly. "Maybe we should split up."

"Very funny. Now be quiet."

Upstairs on the fourth floor, near the freight elevator shaft, Jerry Pershing and Skid Peck, the two musclemen who had been following Annette, waited impatiently. The elevator approached. The two men drew their guns, and Skid glanced at his digital watch. Beyond them sat Ed Taylor, bound in a chair, tape across his mouth.

The elevator arrived, empty.

"What the hell's going on?" Jerry asked.

"You talkin' to me?" said the elevator.

"Shut up," Jerry said.

Skid said, "Where are they?"

"You talkin' to me?" said the elevator.

"Shut up," Skid said.

Jerry took a deep breath. "All right. No need to panic." He pushed a switch on a small box.

Around the warehouse, a series of locks clicked closed and bolts slid home, securing the building.

"OK," Jerry said. "No one's going anywhere." He pushed another switch on the box.

On the first floor, Gizmo, a small robot that looked a lot like a canister vacuum cleaner with a gun muzzle added came to life. Gizmo rolled forward silently.

Jerry said, "Gizmo should be on duty now. You go downstairs. I'll wait here."

On the first floor, Gizmo rolled through a darkened area of the room. The cat cried out again.

Gizmo instantly swiveled, and the gun muzzle tilted down, scanning, searching. "Damn cat." Gizmo's voice had been cloned from a macho action-film star, resonant bass, with a noticeable accent. Presumably, the designers felt the voice was compelling in those situations where no one could see Gizmo. When Gizmo *was* in sight, the voice gave the impression that a ventriloquist must have been part of the team.

Upstairs, Skid swung the elevator gate aside, got in, and swung it closed again. "First floor," he said.

"First floor *what*?" the elevator said.

Skid hit himself on the forehead. "First floor, *please*."

The elevator suddenly dropped about two feet. Skid panicked, then caught himself as he realized he was no longer falling.

The elevator said, "Just kidding."

Nick and Annette crept up the stairs and reached the second floor. They stayed close together and spoke in ultra-soft whispers.

Nick said, "Let's stay on this floor for a few minutes. By now they've seen the elevator. It's easier if they're looking for us than if we're looking for them."

"OK by me," said Annette.

They walked along a wide corridor with darkened rooms off each side. They hadn't gone two meters when they passed a full-length mirror. Annette jumped at the moving reflection, then relaxed. Not far from the mirror, was a faded *Rambo 8* poster showing an *old*

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Stallone with an automatic rifle. Below the poster a sign said, "The wars in Argentina, Brazil, Cuba, Denmark, Egypt, and elsewhere need a few good men."

Little levers extended from Gizmo's body, and he started climbing the stairs. "Damn stairs."

Nick and Annette continued down the corridor, turning occasionally as it made turns around odd-sized rooms. They came to a corner and hesitated, not able to see if anyone might be waiting around the bend. Nick readied his gun and popped around the corner, but no one was there. They kept walking.

Halfway down the hall sat a trio of soft drink machines, two Coca Colas and a Pepsi.

"Thirsty?" Nick asked, joking.

Annette shook her head, but the Pepsi machine responded.

"A drink sure would hit the spot right now. What is life without Pepsi?" said the Pepsi machine, its voice cloned from an I-don't-get-no-respect comedian.

One of the Coca Cola machines said, "Get real. Be Real. Don't tough that inferior stuff, hoser, eh?"

The second Coca Cola machine said, "Yeah. I mean really, eh? Beauty."

"Well at least *talk* to me," the Pepsi machine pleaded. "I'm bored as hell, and these two dorks won't even talk to me."

Nick and Annette shook their heads in wonderment. They moved on.

"Wait! Don't go. I'll give you a free Pepsi. I'll give you both a free Pepsi."

Gizmo reached the second floor. "Phew!" He rolled down the corridor, following Nick and Annette.

Gizmo reached the Rambo poster. Instantly he swiveled and pointed the muzzle toward the poster. "You've got ten seconds to put down the gun."

Gizmo's gun muzzle took aim on Rambo's chest.

Silence.

"You've got five seconds to put down the gun."

Silence.

Time ran out. Gizmo fired at the poster. The wall exploded and crashed down.

The cat cried out, and the *pitter-patter* of running feet sounded in the darkness.

Gizmo swiveled and fired at where he thought the cat sounds had come from. The firing was like machine gun fire. "Damn cat."

Nick and Annette neared another stairwell.

"What was that?" Annette asked.

"I don't want to know. Let's go up another floor."

The collapsed wall had torn a hole in the corridor floor, so Gizmo couldn't get past. He swiveled, examined the situation for a moment, and then retreated. "I'll be back."

Skid got out of the elevator. He scanned the surroundings for signs of Nick and Annette, and saw nothing.

He walked toward the stairwell.

Nick and Annette reached the third floor, and they started along the corridor.

From ahead of them came a constant

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murmuring, like the distant sound of a giant cocktail party.

They moved along the corridor and cautiously approached the door to a very large room. They peeked around the corner. Inside was an enormous collection of appliances including washer/dryers, televisions, old vending machines, phone answerers and other electronic equipment. They were all talking to each other. About the only word heard clearly was a frequent "What?"

Nick said, "If you know me when I'm old, don't ever send me to a rest home."

"You should live so long."

They continued along the corridor. Suddenly Gizmo was visible in the distance.

"What's that ahead?" Nick asked.

"No idea. Unless it's vacuuming."

As Gizmo approached, Nick and Annette ducked into a room to hide.

Gizmo went by the door to the room, continuing on toward the noises down the hall. Nick gestured toward the direction Gizmo had come from.

They tiptoed into the hallway and started their getaway. They had almost reached the stairwell, when Gizmo's voice sounded loudly. "You've got ten seconds to put down the gun."

Nick and Annette turned slowly to face Gizmo, who was now very close. Suddenly Nick grabbed Annette's hand and pulled her toward the stairwell.

They hit the stairwell just as Gizmo said, "You've got five seconds to put down the gun."

Gizmo saw them vanish into the stairwell. "Crap."

Gizmo rolled to the stairs in time to hear the pair's downward footsteps echoing. "Damn stairs."

Nick and Annette dashed out of the stairwell onto the second floor, running as quietly as they could. They passed the mirror again and reached the hole in the hallway floor.

"Come on," Nick said. He made a running start and jumped over the hole. He gestured to Annette to follow.

She hesitated, looking down into the darkness. Finally she got a firm grip on the large purse, and she jumped too. Her feet skidded on the floor for an instant before Nick steadied her.

Nick looked back at the corridor and narrowed his gaze. "Just a minute."

He jumped back over the hole. Not knowing how much time they had, he raced to the mirror on the wall, struggled briefly, and yanked it free.

Near the edge of the hole, he knelt and positioned the mirror lengthwise on the floor, diagonally across the hallway just in front of the hole. He angled it so Gizmo would see neither the hole nor his own reflection as he approached.

Satisfied with his handiwork, Nick backed up for another running start. He jumped over the mirror and just cleared the hole. He teetered on the edge for a second before Annette yanked him forward.

Nick felt her hand on his wrist, and he felt like he'd just almost lost her again. Or vice versa. He said softly, "Damn that answering machine anyway."

Annette reached up and touched his cheek. Her eyes looked larger than normal. Nick's cheek tingled.

The mood was suddenly broken as Gizmo rolled quickly along the hallway.

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They ran a few yards and stopped just around a corner, looking back at Gizmo.

Gizmo's sensors twitched, and he said very quickly, "You've got one second to put down the gun!"

Nick called out, "Get serious!"

Gizmo raced forward, firing at the same time. From their position, ducked behind the corner, Nick and Annette could hear Gizmo as he crashed through the mirror and fell into the hole. As he dropped, Gizmo said, "Damn hole!"

Chapter 18

Gun in hand, Skid moved quietly along the corridor and cautiously approached a corner he couldn't see around. A floorboard creaked somewhere in front of him, and he became even more cautious. The very next floorboard he stepped on squeaked.

Nick and Annette crept along the same corridor, moving toward the same corner. They, too, heard a noise ahead.

"Quiet!" Annette whispered.

As they approached the blind corner from the side opposite Skid, they moved even more quietly.

They crept closer and closer to the corner. Nick was trying to decide whether to stick his head around the bend, when the sound of Skid's digital watch chime came from just around the corner.

Nick grinned. Quickly he grabbed Annette's purse, held it by the top of the long strap, and whipped it as hard as he could around the corner. The purse clunked loudly as it connected with Skid.

Nick stepped around the corner. Skid was sagging. His gun fell from his hand. Nick caught him as he started to fall to the floor. To Annette he said, "Help me with this guy."

Annette helped him drag Skid's unconscious body into a nearby room. Using the man's shirt and pants for bindings, they muffled his mouth and made sure he wasn't going anywhere anytime soon. And now Annette had a gun, too.

As they finished, Nick said, "This isn't the guy we saw before. He must still be in here somewhere."

"Upstairs?"

"Let's go. If your brother really is in the building, that's probably where."

Nick and Annette stealthily went to the end of the corridor and crept up the stairs. Now and then Annette's purse made soft tinkling sounds.

They reached the fourth floor without encountering anyone else and started creeping down the corridor.

They slowly approached the elevator shaft. The elevator was there, but it was empty.

They moved a little farther down the corridor, and encountered a brightly lit room. Against the back wall, still roped into his chair, sat Ed Taylor.

Annette cried "Ed!" and ran toward his chair, using no caution.

"Shhh," Nick said, following quickly, surveying as he went. One wall of the room was broken by a small hallway leading to another room. Nick tried to keep watch on the small hallway and the way they had come.

Annette had started to take the tape off Ed's mouth, but Nick grabbed her arm. "I don't like this."

Annette hesitated. Nick could see she was worried, but that she was also concerned about how Ed was. Ed was not reacting to their presence.

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Nick suddenly glanced back down the small corridor, unsure if he had heard some noise from there or not.

In a room at the other end of the short corridor, Jerry Pershing pressed a button on a hockey-puck-sized device. An inset display flipped to ten and started counting down. Satisfied, Jerry slid the device down the hall.

A half-second later, Nick saw the canister sliding toward him and Annette. "Let's get out of here!"

Nick grabbed the chair Ed was tied to and started pulling him out of the room. Too slow. The combination was so heavy and awkward, it was hernia time.

Annette saw the canister approaching. She swung her purse off her shoulder and, holding the strap, easily batted the canister back the way it had come.

On seeing Nick's astonished expression, she said, "I used to play hockey."

Jerry saw the canister reverse its path. "Damn it! I hate this goddamn job!"

Nick and Annette stood petrified, watching the canister slide back to the room it had come from. A second passed.

Poof! The canister exploded, releasing an enormous cloud of dense smoke.

In a nasal tone, like in the old Roadrunner cartoons, Nick said, "Beep beep."

Nick and Annette moved down the corridor cautiously as the smoke began to thin.

Wisps of smoke still lingered in the air when they found Jerry sprawled on the floor, unconscious.

Nick said, "Now *this* guy we recognize."

"The guy from the airport. Now we can find out who he is."

Jerry had a computer diskette and a pencil in his shirt pocket. Nick took the disk and rolled Jerry's body over to expose his wallet, which he also took. Nick flipped through the wallet, and he began to frown. "Oh oh. This is not really good news. This says his name is Jerry Pershing. And he works for Major Opportunity Business."

"We've been fighting a company? That doesn't make any sense."

Nick started back toward Ed's chair. "Not just any company. M.O.B. is to business what a switch-blade is to a letter opener."

Annette grimaced. "Let's get Ed and get out of here. Or do you think there might be more of them around?"

"I don't know. Maybe Ed knows."

Ed stared just as blankly as he had before.

Annette slapped him lightly. "Ed. Ed. Wake up."

Nick began to untie Ed. "I don't think it's any use. He's comatose."

Moments later they again moved forward cautiously. Nick staggered beside Annette as he carried Ed. Ed was *heavy*.

Annette whispered, "Take the elevator?"

"Thanks anyway. I've already had enough abuse today."

They reached the stairwell unchallenged. Nick pulled his gun as he tried to keep Ed balanced. "Cover the rear, and be careful," he whispered.

"Right." Annette pointed her gun back down the corridor.

Nick stepped into the darkened stairwell. He took a couple of steps down. Suddenly the cat cried out, and some-

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thing moved under Nick's foot. He lurched forward into the darkness. The next step wasn't where it should be, and Nick tipped forward, Ed's weight now moving fast enough that Nick passed the point of no return. He and Ed fell down nearly the whole flight of stairs.

Annette scrambled down the stairs, rushing to catch up with them. At the next floor landing, Ed and Nick lay in a heap.

Nick picked himself up, found his gun, and assumed a stealthy posture, gun extended. He took a couple of steps forward, listening intently. He called out softly, "Here, kitty, kitty, kitty."

"Stop that!" said Annette.

Nick looked sheepish. "Just kidding," he said unconvincingly.

Nick carried Ed as he and Annette crept across the floor toward the front door. They passed Gizmo, who lay flat on his head, surrounded by rubble from the hole in the ceiling. The wheels and levers on his base couldn't help him right himself.

As they watched, a dog approached Gizmo and started to sniff. Gizmo yelled, "Get away! Get away from me! You've got one second to put down that leg."

Nick and Annette left Gizmo where he was and moved toward the front door. Annette tried the door. "It's locked," she said.

Nick shifted his weight and aimed a solid kick at the door. The door, together with the door frame, fell slowly outward and crashed onto the ground, spreading a cloud of dust into the night air. "No problem."

Annette led the way. As Nick walked through the doorway, he clunked Ed's head hard against the wall.

Annette turned quickly. "What was that? Did Ed say something?"

Nick looked down at Ed's head and said, "I really doubt it."

Chapter 19

"Ed! Are you all right?" Annette asked. She and Nick sat in front seat of the car.

Ed sat the back seat and groaned. "What's going on?"

"You tell us," Nick said. "We just got you back from a couple of M.O.B. guys."

Ed put both hands to his head.

Nick didn't feel he should interrupt to explain the bruise.

Ed said. "Oh yeah. Boy, those people were angry. I—" He hesitated. "I found out that M.O.B. made a computer virus. It's been siphoning off money from everywhere. Anyway, I managed to break into their computer system and get their passwords. I had just finished modifying the virus to reverse it—to take money out of M.O.B. Somehow they must have tracked me down, and they grabbed me." He patted his pockets. "Damn. I had it on a diskette, but they must have it now."

"A diskette like this?" Nick asked, showing what he had taken from Jerry.

"Yeah. That's it!" Ed said. "All I need to do is run it on their computer, and it'll reverse the damage."

"But why did they try to get Annette?" Nick asked.

Ed looked at Annette. "I was using a borrowed disk with your name on it. They wouldn't believe me when I told them you had nothing to do with this."

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"What now?" Annette asked.

Nick started the car. "Now we find a phone booth and do some bargaining with M.O.B. Or try. This'll probably be like taking candy from a pit bull."

Nick stood impatiently at the phone booth as his call connected.

"Major Opportunity Business," said the voice on the phone.

Nick took a deep breath. "One of your people has been trying to kill me. His name is Jerry Pershing. You'd better call off anyone else who's after me, or you'll never see him and his partner again."

"And who am I speaking to, please?" The voice was bored, as though Nick had just asked for the time.

"Nick Naught. I'm a private detective."

"Please stand by, while I get more information."

"All right. But hurry."

Annette called out from the car, "What's happening?"

"He's getting more information. At M.O.B., they're probably up to their buns in it." Nick fidgeted as he waited. He looked at his watch.

A moment later he looked at his watch again. "What's the holdup?"

"Please just stand by," said the voice. "I'll have the information in just a minute."

Nick was growing suspicious and nervous. "No. Let's talk now."

"It will be just another minute, sir."

"All right. But hurry." Nick dropped the receiver so it hung from the cord. He ran to the car.

Nick got in and started the car. As he pulled away from the curb, he said, "I don't like this. I bet they're figuring out where this number is. I'll have to call them back from someplace else."

They had traveled less than a third of a block when the phone booth Nick had just left exploded in a luminous orange ball of flame.

Nick looked at the red and yellow destruction, and said under his breath, "Hold all my calls."

A police car flashed past, siren on, without slowing down.

"That's incredible," said Annette. "What are we up against?"

"I don't know. This is even worse than breaking up the phone company." Nick had another thought. "I'm glad I didn't call from home."

Nick retrieved a stack of coins from his pocket. When he had deposited enough of them, the phone played video game winning sounds. Nick dialed a *long* number.

"Thank you for using AT&T," said a voice. "The charge will be $10.00 for the first three minutes."

"If you use Sprint," said another, "the charge will be only $9.50"

"If you use MCI, the charge will be only $9.40."

"AT&T here. Did I say $10.00? I meant $9.35."

"Sprint will do it for $9.00."

One of the other voices softly said, "Slut."

"MCI $8.90."

Nick asked, "Do I hear $8.85?"

"AT&T here. $8.87. That's our final offer."

"Going once. Twice. Three times. *Now* will you put me through?"

"Very well, sir," said the AT&T

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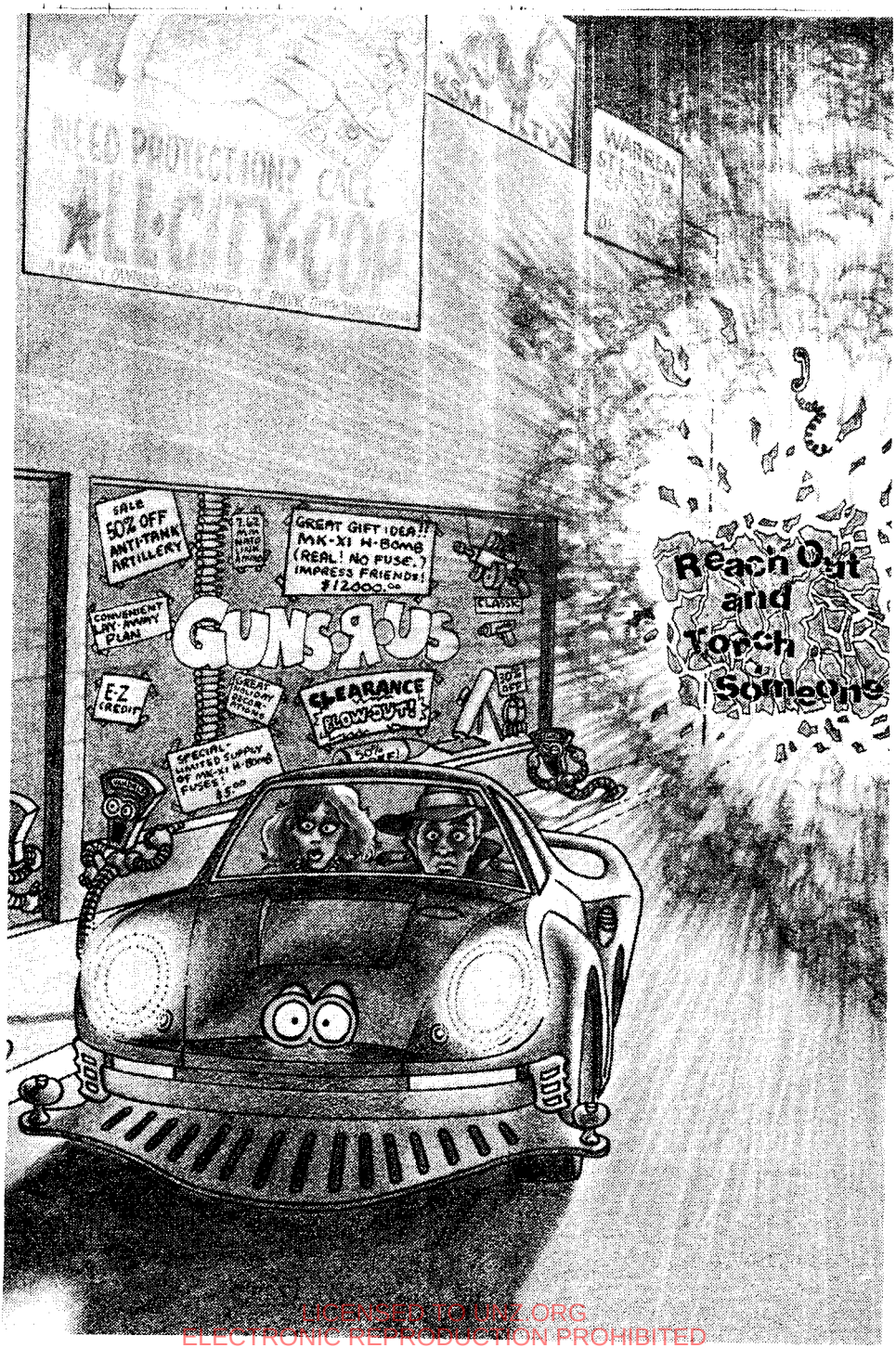

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voice. "For each additional minute that will be $20."

The phone began to ring at the other end. When it was answered, a voice said, "McCormick residence."

Nick said, "I need to talk to Mr. McCormick. This is a major emergency."

"I'm very sorry, sir. It's past Mr. McCormick's bedtime."

"Didn't you hear me? I said this is an emergency."

"I heard you, sir. Maybe if you call back next Wednesday he'll have more time."

"I'm not making myself clear. I'm—"

Click. The connection was broken.

"Damn it. I didn't even get my $8.87 worth." Nick flipped open the coin return. There was nothing there. He banged the phone, and it made a rude noise.

Chapter 20

Nick, Annette, and Ed drove along a dark street. Ed was still a slow conversationalist.

"That's it. We're doomed," said Nick.

Annette turned in her seat. "We can't just give up now. We got Ed back. They can't just kill us."

"No? What happened to that phone booth? Sorry, wrong number?"

"But we can't quit now. Not while they could find us any time. And it won't help to retreat to your island. They'd find us there just as easily."

" 'Us'?"

" 'Us' if you and I are still alive."

Nick glanced over at her and even in the darkness could see her gaze on him. He drove in silence for half a block, thinking about how much he had missed her, then suddenly made a hard right turn. "Call me crazy, but I think it's time we paid a personal visit to Mr. McCormick. Just as soon as we make a stop or two. Is that an autoteller ahead? We could use some money."

It was indeed an autoteller. A minute later Nick entered the brightly lit chamber. Annette and Ed waited in the car.

Nick fed his card into the slot. "I need five hundred cash."

The autoteller sounded like an old traveler's check advertiser. "Very well, sir. Please enter your personal code letters."

Nick entered the letters on a small keyboard.

"I'm sorry, but your account has a balance of only two hundred and fifty dollars."

Nick hesitated. "Look, I'm going to toss a coin. If you call it correctly, I'll give you five hundred. If you're wrong, you give me the extra two fifty. How about those odds?"

"Well—all right."

Nick flipped a coin and held it against the back of his hand. "All right. Call it."

"Heads," said the autoteller.

Nick rolled his hand forward, so he showed the machine the coin tails up on his palm, instead of heads up on the back of his hand. "Tails. Sorry, you lose."

"Crap! OK. Here you are." The drawer opened, and Nick took out the $500.

"Thanks. But look, I can't take your money like this. Just to show I'm a good sport, I'm going to even things up. I have another account here, under my

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pen name. I'm a writer. You have a record of that account? For Jerry Pershing?"

"Yes."

"Fine. Just transfer two fifty over to cover this."

There was a short delay. "Completed. Thank you, sir! That leaves six hundred and forty-two thousand in your Pershing account."

Nick tried to conceal a sudden grin. He glanced around, then turned back to the autoteller camera lens. "You know, I just realized. I've got a tax payment coming up. Would you go ahead and transfer over the whole account?"

After another short delay, the autoteller said, "Certainly, sir. All finished. Anything else?"

"No, thanks. Maybe tomorrow."

"You sure seem happy," Annette said when Nick got back into the car.

"Sometimes I just love my job," Nick said. "Maybe it's the danger."

In a department store, Nick and Annette walked down an aisle.

"What exactly are we looking for?" she asked.

"I'll know when I see it. Something to make it easier to get in without attracting a lot of attention."

"Something like this?" Annette pointed to a large box on the shelf. It was labeled, "Acme All-Purpose Break-In Kit."

"Yeah! That's terrific. And this is even better." Nick pointed next to it, at a similar package, but larger, labeled, "Acme All-Purpose Break-In Kit. Economy size. Enough for two people."

The sales clerk who rang up the sale wore a name tag saying, "N. KNOTT." His mustache looked as if it had been scribbled above his upper lip.

Chapter 21

Nick's car was parked beside a tall stone fence. In the weak light spilling from the interior of the car, Nick and Annette finished pulling stuff out of the break-in kit and loading it into small pockets in the multi-pocket hunters' vests they now wore.

A sign on the fence said, "No Trespassing, No Stopping, No Loitering, No Kidding."

Nick leaned into the car and said, "How about if you stay here, Ed? You've had enough for one day."

Ed nodded, then rubbed the bruise on his head. Nick grimaced.

Annette put the gun they had confiscated from the warehouse in the back seat with Ed. "You probably need this more than I do," she said. Ed nodded and left the gun where it was.

Nick pulled out an ugly gun designed for shooting a grappling hook attached to a rope.

Annette said, "This is crazy, you know."

"You said that already." Nick readied the gun. "I always wanted to do this."

He aimed for the top of the fence and pulled the trigger. Instead of shooting the grappling hook up just a few yards, the grapple shot up like a rocket, as if it were trying to reach the top of Mount Everest. Rope kept coming and coming out of the supply reel.

Annette said, "Maybe this is the high-rise kit."

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Nick pulled on the cord to draw it tight. He drew and drew and drew.

Inside the fence, Nick and Annette sneaked from tree to tree in the moonlight. Ahead an M.O.B. guard paced near a pool of light spreading from a floodlamp mounted on the building wall.

"What do we do now?" Annette asked. "Do I try to seduce him?"

"Don't be silly."

"What exactly do you mean by that?" Annette looked frostily at him.

"Nothing. Nothing. I just mean it's not appropriate just now. Maybe later." Nick winked at her and wiggled his eyebrows. "I've got the tranquilizer dart gun. I'll shoot him. Simple."

"You got a *small* tranquilizer dart to shoot *me* with?"

Nick took aim and shot the guard.

The guard twitched, then apparently decided he had just gotten bit by a mosquito. A long second passed. Finally in mid-step the guard keeled over.

Nick and Annette started forward. Suddenly Nick stopped.

"What's wrong?" Annette asked.

Nick lifted the heel of his shoe to examine it. "They must have a dog."

A half-minute later, they passed a large electronic bug zapper. Underneath it, on a pile of dead insects, lay several dead squirrels and birds.

Nick stopped suddenly. "You see that?" he asked, pointing.

In the distance, a security camera panned back and forth.

"Yeah," she said. "Maybe the paint gun would work here?"

"Sounds good. How's your aim?"

"We'll see."

Annette aimed her gun, held her breath, and gently squeezed the trigger. A blossom of black paint formed on the camera lens. Not even trying to contain her satisfaction, Annette blew across the gun muzzle.

In the monitoring room inside the house, two M.O.B. guards were leaning back in chairs, paying more attention to their card game than to the bank of video monitors. A monitor showing an expanse of grass and trees in the yard suddenly went dark.

"Not another one," said one of the guards.

In the vast bank of video monitors, about half of them no longer worked.

"Where's the trouble log?" asked the other guard. "I'll make a note of it." A huge volume, the size of the braille edition of the New York State phone book, crashed onto the desk in front of him.

Nick and Annette worked their way closer to the building.

"So far so good," Annette said. "Where do we go next?"

"This may tell us." Nick used a flashlight to illuminate a map on the wall. One label said, "You are here." One of the doors was labeled, "West entrance." The keypad adjacent to the door looked like a touch-tone phone pad.

Nick looked at his notes, then typed in a number, and the door lock *clicked*. "Thank you, Ed," he said softly.

They opened the door and moved slowly through, into the building. Annette touched Nick's arm and pointed.

Down the hall was another monitoring camera panning slowly toward their

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location. Annette aimed her paint gun and shot at it.

Another monitor went dark.

They walked stealthily down the hall. At the next corner they peered around and saw another guard approaching a coffee vending machine. "Coffee, black," the guard said. He sounded bored and half asleep.

The machine dropped a cup into the front slot, and then squirted the man with coffee. The coffee did the trick; he was awake instantly. He kicked the machine.

As if the machine was retaliating, it squirted him again.

The guard's face turned mean. He carefully moved to one side of the machine and gave it a good hard kick.

The machine changed its aim and squirted him again.

The guard pulled out his gun. "That's it! That's the last bugging time!"

Nick reached around the corner and shot the guard with a tranquilizer dart. The guard keeled over.

Nick and Annette moved around the corner. They dragged the guard over to a door and stuffed his body into a closet with an automatic vacuuming machine that looked uncomfortably like Gizmo.

They continued along the corridor, stopping at an elevator next to another you-are-here map. Beside the map was a sign that said, "The price of freedom is eternal vigilance."

Nick looked long and hard at the elevator button. As he was about to push it, Annette grabbed his hand.

"Look." She pointed to a sign saying, "Stairs."

"Excellent idea."

At the next level up, they peeked through the doorway crack and saw no one.

They moved along a carpeted corridor and came to a closed door bearing the sign, "Computer." They cautiously opened the door, entered, and shut the door behind them. Lights came on automatically, and Nick moved forward. A large console with several computer screens and keyboards lay darkened. Nick flicked a switch, and the console came to life. "Let's see how good the rest of Ed's information is, shall we?"

Nick sat down at the console and typed a few characters on the keyboard.

"Hello," said the computer. "Would you be wanting to log on?"

"Yes," said Nick.

"Very well, sir. What is the password?"

Nick took a deep breath. "Submarine hamster."

"Access permitted."

Nick began to breath again, and put a diskette into a disk drive. "OK. Read that and execute."

The disk drive activity indicator came on.

To Annette, Nick said, "That should start Ed's, er, program."

"Completed," said the computer a moment later. "Any other requests?"

Nick and Annette looked at each other blankly for a moment. Nick shrugged and turned back to the computer. "Change password."

"Very well, sir. Please confirm the old password."

"Submarine hamster."

"Very well, sir. What is the new password?"

Nick thought for a moment. "McCormick sucks."

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"Please repeat for confirmation."

"McCormick sucks."

"Completed. Any other request?"

"No. Log off."

"Very well, sir. Goodbye."

Nick retrieved the diskette and went back to the door with Annette. Nick opened it just a crack and peered out. They exited stealthily.

One floor up, they stopped and again pulled a stairwell door open a crack. This level opened onto a hallway much like the last. Lounging near a closed hallway door were three more guards. Nick let the door close lightly.

"What now?" Annette whispered.

Nick pulled a pellet out of a pocket. "This is the only thing we've haven't used so far, so it *must* be what we need."

"What is it?"

"A smoke bomb. I've got a couple of them, but one should be enough. Once it goes off and confuses them, I should be able to shoot them with tranquilizer darts."

"Well, we can't stop now."

They pulled the door open again, just a crack. When the guards were looking the other way, Nick quickly opened the door farther and threw the pellet along the floor.

The pellet came to rest right next to the trio of guards.

One of the guards cocked his head, looked around near his feet, and noticed the pellet. "What the hell is—"

The pellet exploded in a burst of smoke.

Nick opened the door all the way and shot each guard.

The smoke was dissipating already as Nick and Annette arrived. Nick pulled his real gun from behind his back, reconsidered, then kept his tranquilizer gun ready as he slowly opened the door to the room that had been under guard, a bedroom.

The room was dark. They crept into the room, stopping next to the bed where Mr. McCormick and presumably Mrs. McCormick lay asleep. Annette switched on a small lamp. Nick kept the tranquilizer gun ready, and he nudged Mr. McCormick's shoulder.

Mike McCormick jolted awake. "No, not OSHA! Not that!"

"Calm down, Mr. McCormick. It's just a dream."

"Thank God." McCormick blinked. "Who are you? And why are you in my bedroom, holding that gun? Damn it, I hate it when this happens!"

Downstairs in the monitoring room, a guard said, "Oh, God. We have a hell of a problem here."

The other guard joined him in looking at the monitor showing Nick holding a gun on Mr. McCormick. "Damn. Do we ignore it or tell him we've got a camera in there?"

Nick said, "We're not here to harm you, Mr. McCormick. We just want some answers, and we want to be left alone."

Mrs. McCormick stirred. Half asleep, she said, "Not *again*, Larry. Wait 'til Christmas."

McCormick said, "Go back to sleep, Cathy." To Nick and Annette he said, "What's this all about?"

There was a knock at the door.

"Get rid of them," Nick said. "Or you'll have more trouble on your hands." Nick held his tranquilizer gun on him as McCormick went to the door and

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peeked through a privacy spy eye. He opened the door.

The guard at the door said, "I'm sorry to wake you, Mr. McCormick, but we have intruders. Several of the staff have been found unconscious."

"All right, Ellis. I'll stay right here." McCormick closed the door. "Now. Who the hell are you people?"

"My name is Nick Naught. This is Annette Taylor. Your goons kidnapped her brother. We've got him back, and we want you to lay off. Otherwise, a lawyer who's got the whole story will make it public."

"You're not Nick Knott."

"Why do you say that?"

"He's much older."

"So you're *not* after me? You're after someone else? Well *that* should simplify things a little."

As Nick finished speaking, the door burst open and four heavily armed guards piled into the room. Nick looked at his tranquilizer gun and sighed. He put the weapon on the table.

As the guards led Nick and Annette out at gunpoint, Mrs. McCormick stirred in bed. Sleepily she said, "Not again, Larry."

"Great work," said McCormick. "But how did you know they were in here?"

One of the guards said, "Can we talk about that a little later, sir?"

Chapter 22

In the computer room once again, Annette and Nick stood, covered by guns held by M.O.B. guards. The door to the room opened. McCormick looked away from Nick as Paula Rosenberg and Dennis Cotton entered. Both looked sleepy. Rosenberg had her coat on inside out.

McCormick said, "What the hell's going on here, Rosenberg? This guy says he's Nick Knott."

"He can't be," Rosenberg said. "He's not old enough. You saw the picture, too."

"Sure, he is," Dennis said. "That's the guy on my form two-twelve." He took a folder from his pocket and withdrew his paperwork with Nick Naught's photo.

Rosenberg grabbed the photo and examined it. She turned to Dennis. "That's not the right Knott. This thing says Nick Naught. You idiot!"

"I'm an idiot? What are you talking about?" Dennis asked. "I can't help it if there was a screw-up. That's the guy I was told to get."

Jerry and Skid entered and joined the crowd. Jerry glared at Nick.

"What are *you two* doing here?" Rosenberg demanded.

Jerry said, "We found Ed Taylor sleeping in a car outside. We gave him another sedative and left him—" He did a double-take at Annette. "You got her already! Why didn't you tell us?"

"Got who?" Rosenberg asked.

"Annette Taylor. The guy's sister."

McCormick threw up his hands. "Wait a minute. Wait a minute! Things are getting way too confused. Let's start at the beginning." To Rosenberg, he said, "Where's *your* file photo on Nick Knott?"

"I don't have it with me. But the computer should have one."

"We'll see. At the rate things are going tonight, it'll be screwed up, too."

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McCormick turned to the computer terminal. "Log on."

"What is the password?" asked the computer.

"Submarine hamster," McCormick said confidently.

"What?"

"Submarine hamster," said McCormick more loudly.

"What?"

"Submarine hamster!" McCormick's cheeks turned pink.

"Warning! Warning! Unauthorized intruder alert. Password authorization failure." The computer paused. "One last chance. What is the password?"

Ultra calmly, between deep breaths, McCormick said, "Submarine hamster."

"Final warning! Final warning! Unauthorized intruder alert. Password authorization failure. Hostile takeover alert." A siren warble started up. "Destruction countdown commencing. One hundred. Ninety-nine—"

Pandemonium began.

"This can't be happening!" McCormick said.

The guards began to edge toward the door. "Stay right here," Rosenberg demanded.

The M.O.B. computer continued counting down.

McCormick pointed to a large panel. "The computer itself is through there! It's got its own power, and it's supposed to protect against a hostile takeover. We've got to switch it off before it blows up the bugging building!"

A guard rushed toward the panel and tried the handle. No luck. Another guard started to ram his shoulder against the panel. He was ineffective.

Jerry and Skid looked extremely nervous. They focused their attention on McCormick. A third guard rushed toward the panel to help, leaving only one guard to watch Nick and Annette. The remaining guard was so engrossed in watching the commotion near the panel, and looking nervously at his watch, that Nick was able to take a short step while the guy was looking the other way.

Nick bashed the back of his fist into the guard's face. The guard slumped in Nick's arms, and Nick let him settle on the floor.

Nick grabbed the guard's gun. Together he and Annette slipped out the door they had come in through.

As Nick gently closed the door to the computer room behind them, he said, "You don't mind leaving the party early, do you?"

Annette said, "As long as you don't tell my parents."

They ran down the carpeted corridor and into the stairwell.

McCormick and his employees continued their attempts to break down the panel to get at the computer. The three guards ran in a group toward the panel, their shoulders together. They bounced off.

"Seventy-four. Seventy-three—"

Nick and Annette reached the first floor.

McCormick pleaded. "I'm a reasonable man. Now you be reasonable. I gave you the correct password."

"Sixty-eight. Sixty-seven—"

Nick and Annette ran along another corridor. They whipped around a corner and slammed into a guard who had been bringing Ed inside. The M.O.B. guard's

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head hit the wall, and he was out. Nick grabbed Ed, who was groggy again, and they continued their escape, a little more slowly.

McCormick's employees took another run at the panel. It seemed to give a little, but it held.

"Forty-two. Forty-two. Forty-two," said the computer. "Just kidding. Thirty-eight. Thirty-seven—"

Nick and Annette and Ed ran out the door and started across the street.

"Twenty-six. Twenty-five—"

Rosenberg said, "Boss, we'd better get out of here!"

"No! Keep at it!" To the computer, McCormick said, "Now listen to me very carefully. This is a mistake. I gave the correct password. Submarine hamster. Stop this right now!"

"Twenty-two. Twenty-one—"

"You stupid son of a bitch!" McCormick slammed his hand against the computer monitor.

Suddenly the computer countdown changed. The computer had been counting one number per second, like a shuttle launch. Now its voice was a blur as it counted down much more rapidly. "Fifteen twelve ten eight six four two one."

In the half second of agonizing silence following the completion of the countdown, Rosenberg gave McCormick a rude gesture and mouthed a very unflattering word.

The room they were in exploded.

Safely outside, Nick, Annette, and Ed watched as McCormick's house turned into a mass of light. Every room in the huge house was destroyed in a rippling series of explosions. The three survivors stumbled as the blasts shook the ground under their feet, but they were far enough away to survive. They got to their feet and looked back at the destruction. Nick and Annette put an arm around each other's waist.

A fire truck and an ambulance approached, sirens wailing, lights flashing. They sped past without stopping, already on their way to some other emergency.

Nick took a deep breath. "I think I could use a drink."

Chapter 23

The drink in Nick's hand sloshed gently from side to side, and the ice tinkled against the glass. The dull roar of a plane in flight muffled conversations elsewhere in the passenger cabin. Next to Nick, Annette sat in the window seat.

A flight attendant handed Annette a drink and continued walking down the aisle, checking on passengers.

Out the window Nick could see the wing. A gaping hole showed where the main jet on that side used to be.

Annette took a sip of her drink, then sighed. "I think I'm really going to enjoy relaxing for a while."

"Me, too. Think of it as a gift from Jerry Pershing."

Annette looked puzzled, but before she could ask Nick to explain, the plane lurched and the pilot's voice came over the P.A. "Don't panic, ladies and gentlemen. We've developed a spot of engine trouble. I'm dreadfully sorry, but I'm afraid we're going to have to ditch."

In the sudden silence, Nick shook his head. "I hate it when this happens."

As the passengers panicked, the over-

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head compartments opened automatically, and oxygen masks dropped. The masks all looked like funny animal snouts, and the passengers didn't look at all dignified as they put their masks on.

Suddenly the vibration stopped, and the plane resumed normal flight.

The pilot's voice said, "Just kidding."

As the passengers deplaned, the stewardess was saying good-bye to everyone. Young native women gave leis to the arriving passengers.

Annette passed the cockpit and made the turn to exit the plane.

As Nick followed her past the cockpit, he pulled from his shirt pocket one of the unused smoke bomb pellets. He casually flipped it, Bogart style, into the cockpit and pulled the door closed. The door latched.

Nick exited the plane smiling, as the pellet exploded and smoke started to ooze through the seam next to the door. The view through the cockpit window was solid black.

Nick said, "Just kidding."

Nick and Annette walked down the ramp, arm in arm.

* * *

Chapter 24

Annette reclined in a beach chair, wearing a lei. Far away in the water, a police boat cut through the waves, running its siren. A cop's megaphoned voice was too far away to hear clearly. The gray beach extended in all directions from Annette's chair. If any remaining spots between occupied beach towels and chairs were larger than a square meter, they certainly weren't visible from where Annette sat. The beach looked endlessly crowded.

Next to Annette's chair, Nick bent over and balanced on one foot while he inspected his heel for evidence of dog.

As he did, Annette pinched him on the rear. She smiled with satisfaction at his startled expression.

Epilogue

Late at night in a deserted Los Angeles office, a telephone rang once. It rang again. And again. Finally the caller's attention span elapsed, and the phone stopped ringing.

The call would have been answered, but the phone answerer sat in the wastebasket, in even more tiny pieces than it had begun life with. ■

●Never mistake knowledge for wisdom. One helps you make a living; the other helps you make a life.

Sandra Carey

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Stephen L. Gillett, Ph.D.

FIRE, BRIMSTONE—AND MAYBE LIFE?

Alien biochemistries . . . It has an impressive ring, but it's pretty vague. What do we mean by "alien"? Not carbon based? Not water based? Breathing something other than oxygen? Having a different genetic code than DNA? Having basic molecules different from proteins, sugars, and lipids (fats)? Or just having a different mixture of amino acids? Some of these ideas are a lot more "alien" than others; life not based on carbon, for example, is profoundly different from Earthly life, whereas not breathing oxygen is a trivial difference biochemically.

In fact, lots of Earthly organisms don't breathe oxygen, either. Most bacteria use anaerobic respirations, which come in a bewildering variety of different styles. Oxygen respiration is a recent evolutionary innovation; to this day the cell nuclei of higher life forms are poisoned by direct exposure to O_2. *We* think oxygen's important, because it's a high-energy respiration that allows multicelled life forms like us to exist. However, that's hardly fundamental!

Thus, even if we stick to carbon-based life, the plethora of anaerobic lifestyles among Earthly bacteria shows that there could be lots of variations in biochemistry. Carbon chemistry just sets the framework. The superstructures could be very different, and exotic indeed.

For example, a few years ago (*Analog*, Oct., '84) I speculated on halogen breathers. In this article, I'll speculate again, this time about biochemistries in which sulfur and its compounds play a major role. To be sure, sulfur has a supporting role in Earth's present biochemistry. It's a necessary component of the amino acid methionine, for one thing. But maybe elsewhere sulfur or its compounds have a much more fundamental place in the biochemistry, like water or oxygen on Earth. And—unlike the halo-

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gens—we already see a world in our own system whose surface is dominated by sulfur: the Jovian moon Io. So we *know* the element can get concentrated by natural processes to the point that it's the major volatile ("volatiles" are low-boiling-point elements in atmospheres and oceans) on the surface.

To Breathe, Perchance to Dream

Some years back, Hal Clement wrote a great alternate biochemistry novel (*Ice World*), in which aliens from an extremely hot planet breathed gaseous sulfur instead of O_2. The story is told mostly from the viewpoint of the aliens, as they confronted the (to them) frigid and bizarre environment of the Earth. (Although, in reading the story, I was always bothered that the aliens had so much trouble figuring out Earth's chemical composition. Had they really not heard of spectroscopy? They shouldn't have actually had to go down to the surface to do chemical experiments.)

Anyway, Clement's rationale for the aliens' breathing sulfur was that sulfur is the element corresponding to oxygen, down in the next row of the periodic table of the elements. So the elements' properties are somewhat similar. It's just like postulating silicon-based life forms from the fact that silicon is the second-row element corresponding to carbon.

Unfortunately, although it was a very clever idea for a story, sulfur is really not so much like oxygen as Clement implied. It's true that in the periodic table sulfur occurs in the second row, just below oxygen. And the elements do have a number of chemical similarities. But even so, their differences are profound. (Actually, none of the first-row elements is much like its second-row homolog. As I remarked in the halogen article, fluorine and chlorine aren't much alike, either. The second and third row elements are much more similar to each other than either is to the first. For example, sulfur and selenium are much more alike than either is to oxygen. And silicon and germanium are much more similar than either is to carbon. And so on.)

So what are these differences? For one thing, oxygen is a much better oxidizer than sulfur. (Well, yeah, it sounds like it *should* be, but the best oxider is *not* oxygen! It's not sulfur, though, it's fluorine.) And you need a good oxidizer to get lots of energy from oxidizing food—necessary if we want to construct beings more complicated than microbes.

For another thing, sulfur's chemistry is much more complicated than oxygen's. There are two reasons for this: First, sulfur has an extra electron shell (the *d* shell) available to make chemical bonds with, so you can get complicated ring and chain molecular structures that oxygen just can't handle. (For example, ordinary oxygen is just O_2, whether liquid or gas. Sulfur, however, in going from solid to liquid to gas, changes from 8-member rings, to long chains of linked S atoms, to S_2 molecules—among other things! In fact, the only element better than sulfur at linking to itself is carbon.)

Second, oxygen is a much smaller atom, so you can't pack as many other

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atoms around it. This makes oxides, in general, much more compact than sulfides. However, oxides tend to make more complicated chains than sulfides, because atoms can share a linking oxygen. Finally, oxygen can also form double bonds of a type (p-p) that sulfur can't.

Also, in a strictly sulfur-as-analog-to-oxygen biochemistry, you'd expect H_2S, hydrogen sulfide, to be the analog to water. Only this doesn't work at all. H_2S is *not* like water. (The same way HCl's not much like HF, for those of you who saw the halogen-breather article.) Water has a relatively high boiling point, and a long liquid range, because of "hydrogen bonding": the hydrogen atoms in one water molecule are attracted to the oxygens in another, and form tenuous bonds to it. Fleeting though they be, the energy needed to break these bonds is what gives water that high boiling point and long liquid range. Other small, highly oxidizing atoms besides oxygen (fluorine and nitrogen, chiefly) also form hydrogen bonds. Sulfur, however, does not.

So, H_2S has a very *low* melting point (-85.5°C) and a very short liquid range (it boils at -60.5°C). By contrast, sulfur boils at 444.6°C. Obviously, then, aliens cannot breathe gaseous sulfur while having seas of liquid hydrogen sulfide! (Clement, of course, realized this, and he did *not* have H_2S as the analog to water in his alien biochemistry. His was more complicated, although he didn't give details.)

It's even worse for H_2S, though: it's easily photodissociated. That is, in an atmosphere it's easily broken up into hydrogen and sulfur by solar ultraviolet light. That's a problem because, for a world with gravity about like the Earth's, the hydrogen can then escape into space. Venus has probably lost an ocean's worth of water through photodissociation, and water is a good deal harder to break up with UV than H_2S. Earth's water has been spared only because Earth's atmosphere is cool enough that most water freezes out before it gets high enough to be destroyed. But for a low-boiling-point compound like H_2S—well, it's gone in no time, geologically speaking.

Last, oxygen is a far more common element than sulfur, cosmically. The most common oxygen isotope, O^{16}, with 8 protons and 8 neutrons, has an especially stable nucleus and thus is favored by the nucleosynthetic processes that build up heavy elements.

The bottom line is that sulfur breathers are just not reasonable. You can't get much energy by reacting things with sulfur, especially at temperatures where sulfur's a gas! You can get enough to run the metabolism of something like a microbe (and in fact, some of those anaerobic respirations by Earthly bacteria use sulfur compounds), but it's just not gonna work for something like an intelligent alien.

All right, forget it, then, forget it. Those Stuffy Ol' Signtists Say It's Impossible. Kill-Joys! Gleefully telling us in excruciating detail Why It Just Won't Work.

Wait a minute. I didn't say we should stop speculating. But we'll just have to

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be a bit more subtle. (We won't manage to get as subtle as nature, but we can try.)

Io, the Brimstone Planet

Let's start with Io as a source of inspiration. Here, we at least can see a world dominated by sulfur! What might fit in this environment?

To see, let's review what Io's environment is. The first point is the highest rate of volcanism known in the Solar System. The energy for this volcanism is driven by tidal flexing. Because of a peculiar interaction with Jupiter's other satellites, Io is continually flexed like a tennis ball being rhythmically squeezed in a fist, and the energy dissipated from that squeezing shows up as heat in the interior. (The energy, of course, is drawn from Io's orbital motion, so it can't last forever. It can last for quite a few million years more, though.)

The second point is that sulfur dominates Io's surface, and most of the volcanism we see involves sulfur. Sulfur lavas splash and ooze across the surface, and sulfur-dioxide driven vapor eruptions spew material for hundreds of kilometers across the landscape.

The sulfur is a veneer, perhaps only a few meters to maybe a couple hundred meters thick. It is melted by ordinary silicate (rock) lavas at depth. Io's density is about like the Moon's, so it can't be *all* sulfur. There's got to be a lot of rock below. And in fact, some of the topography we see on Io has to be supported by rock. The scarps are just too tall; sulfur isn't strong enough.

Planetary geologists studying Io's sulfur lava flows have a nice source of large-scale experiments. On Earth, pure sulfur occurs here and there in sedimentary rocks—it's the preserved product of bacterial action—and is mined in the Frasch process. Superheated water is pumped down a pipe in the middle of a drill stem to melt the sulfur, and the molten sulfur is then forced up to the surface around the outside of the pipe. At the surface, the molten sulfur is channeled into bins, where it flows out, cooling and making layers. . . .

Just like lava flows!

(This is one of a number of instances where industrial processes have proven to be useful models of planetary processes. They're especially handy because industrial processes are carried out at a much larger scale than planetary scientists can afford.)

Anyway, Io has been rendered down to the least-volatile volatile: sulfur. And sulfur dioxide (of which *much* more anon) is also common in and around Io's surface. But hydrogen, nitrogen, carbon compounds: they're boiled out almost completely. No water, no hydrocarbons, no ammonia; not even hydrogen sulfide.

Io's almost as baked-out as an inner system world like the Moon or Mercury. And, based on the compositions of the other large Jovian satellites, which contain lots of ice, it probably started out *much* richer in volatiles than anything in the inner System. What happened?

Several things, probably. One is that high rate of volcanism. One or several of Io's volcanoes is always active, melt-

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ing or vaporizing anything that's even somewhat volatile and spewing it out as hot lava, or hot gas, at the surface.

And that pervasive stewing brings up the second thing: Io's low gravity. It's low enough, and the stuff is hot enough, that it tends to keep going off the planet completely. Only the heaviest material sticks around.

And last, almost as icing on the cake, is photodissociation. If you boil those vapors out where they can interact with solar UV, they get broken up into their constituent atoms. And when that happens, really light atoms like hydrogen are *gone!*

Thus, only sulfur can't get away, at least at a high rate. It's a heavy atom, so although it's relatively low melting, it just can't escape like the lighter volatiles can.

Its volatile compound, sulfur dioxide, SO_2, also can't escape. Oxygen, although lighter than sulfur, is (as I've said) an *extremely* common element, and it also tends to stick around 'cause it's relatively heavy.

Sulfur dioxide on Io is also immune to photodissociation. True, solar UV can bust up SO_2 easily enough. The energy of the S-O bonds is not gigantic; in fact, they're weaker than H-O bonds in water. (Even low-energy red light suffices to break up SO_2.) But again . . . both S and O are massive atoms! So, in contrast to a hydrogen-bearing molecule, even if the molecule is split up, the atoms hang around until they eventually combine again. (On Io, it's even better, since any S or O atoms that *do* manage to leave Io are still deep in Jupiter's gravity well. So they tend to stay in Io's orbit, and are swept up again by Io sooner or later. In fact, there's an extremely tenuous gas torus around Jupiter, along Io's orbit, that contains various atoms blown off Io.)

If you remember your industrial chem, you know that under duress SO_2 further reacts with oxygen to give sulfur trioxide, SO_3, which is then dissolved in water to give commercial sulfuric acid, H_2SO_4. You *don't* get SO_3 on Io, though, because of all that extra free sulfur lying around. It reacts with any SO_3 that might get made to give you SO_2 again.

So the system is quite stable.

Now, about those explosive eruptions . . . . It looks as though sulfur dioxide on Io acts rather like water in Earthly volcanic processes. Most "volcanic gas" on Earth is just *very* hot steam. And the spectacular eruptions we think of on Earth, things like Vesuvius, Mt. St. Helens, are basically just *very* large steam explosions. (They powder a lot of rock in the process; powdered rock is all that volcanic ash is.)

Sulfur dioxide? Like water?

In some respects. Yes, it's a gas at ordinary temperatures, but it has a relatively high boiling point: -10°C at 1 atmosphere, 15°C at 2.5 atmospheres. And it freezes at -75.5°C, so it has a liquid range of about 65°C—not bad at all! (Again, water's long liquid range and high boiling point result from hydrogen bonding. SO_2 obviously has no hydrogen bonding, but something similar occurs; the oxygens of one molecule have a fleeing attraction to the sulfur in another molecule.)

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OK, so sulfur dioxide is like water in that it makes for spectacular volcanic eruptions. But might the similarity run any deeper than that?

Maybe.

SO_2, like water, is a good solvent. Maybe even a good enough solvent to support a biochemistry.

It has great differences from water. For one thing, it's not nearly as polar as water. (A "polar" molecule has an uneven distribution of electrical charge. In water, for example, the hydrogens are slightly positive and the oxygen slightly negative.) Polar molecules are good at dissolving salts, like table salt (NaCl) or Epsom salts or baking soda. When dissolved in a polar solvent, such salts get broken up into ions (charged atoms); Na^+ and Cl^- for table salt, Na^+ and HCO_3-for baking soda, and so on.

Sulfur dioxide is different; it doesn't dissolve most inorganic salts. It's more like an organic solvent, like gasoline or benzene or carbon tetrachloride (OK, "tetrachloromethane," for you nomenclatural purists).

Thus, when you get right down to it, SO_2 probably dissolves a lot more organic compounds than water does. A number of organic syntheses are routinely carried out in sulfur dioxide solution. And finally, because of those oxygen-sulfur interactions, SO_2 is a better solvent than you'd expect even for some moderately polar compounds. It busts them up into ions just like water would.

So, all this means is that biological reactions will be different. It doesn't mean they would be impossible. For example, SO_2 dissolves lipids just fine. If a *bit* of carbon and nitrogen and hydrogen has survived on Io, and has dissolved into the SO_2 reservoirs . . . well, let's go look!

If you have life, you need an energy source for it. On Earth, of course, the basic energy source is sunlight. This probably won't work on Io, though. It's too small and too cold, so that liquid SO_2 is not stable at the surface. You get SO_2 frost instead, which freezes out after being spewed out by volcanism, and sublimes again with more volcanism (or maybe even with sunlight, in dark-colored areas).

Surely *some* planet out there has SO_2 oceans, though. A bit bigger than Io, so it can retain a thicker atmosphere; maybe just a bit closer to its sun, so it has liquid SO_2 instead of frost. . . .

But back to Io. Is there an alternative energy source? What about volcanic heating? Liquid SO_2 *is* stable at depth in Io. It has to be, at least in places, to drive those eruptions. It's been estimated that liquid SO_2 might be stable in Io's crust over a vertical kilometer or so. Of course, the sun doesn't shine down there, but there's nonetheless lots of energy seething around because of all that volcanic activity.

(This is a bit reminiscent of the seafloor communities in terrestrial rift zones, which run their metabolism in part off compounds in seawater heated and expelled at volcanic vents. However, the statements in the popular literature that these communities are completely independent of the Sun are a bit overstated. Many of the organisms use

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oxygen, and that O_2 comes from surface photosynthesis.)

I've digressed again. Back to Io.

One possibility for a metabolic energy driver is the SO_3-S reaction. Organisms would store energy by making SO_3, using volcanic heat:

$$3\ SO_2 = 2\ SO_3 + S$$

(with, of course, appropriate enzymes to catalyze the reaction).

Later, when they needed the energy, the organisms would react the SO_3 with S to make SO_2 again.

This is *not* a high-energy metabolism . . . it releases only about 37 kilocalories, about like most anaerobic respirations on Earth—and much less than aerobic respiration with O_2. So it can probably power microbes OK, but nothing more complicated. And obviously, with all that raw sulfur around, you can't ever build up free oxygen. So Io will be stuck with microbes-only life for the duration.

Still, even an alien microbe would be nice at this point, after Mars and Venus have turned out so dismally. . . .

The Sulfuric Acid Sea

Well, it's dull to stay *just* with what we know in our own system. So I'll conclude this article with some total speculation.

Suppose, somewhere, there's a world with a bit more gravity than Io, and maybe a bit less sulfur. And a *lot* more oxygen. The planet started out with a lot of water, but it was subjected to intense photodissociation, so that the hydrogen was lost and the oxygen left behind. Maybe this planet circles a hot, type F star, which puts out much more UV than the Sun, and which would ferociously shrivel water down to oxygen on potentially Earthlike worlds.

Of course, the oxygen oxidizes all the sulfur, not just SO_2, but to SO_3, sulfur trioxide. And—standard industrial chemistry again—*that* reacts with water to form H_2SO_4, oil of vitriol, sulfuric acid.

Because of this, you won't lose *quite* all the hydrogen. As the sulfur trioxide gloms onto the last bit of water, it preserves it from photodissociation. (This has happened on Venus. The planet's last smidgen of water is protected from photodissociation by being bound up into the sulfuric acid droplets that make up the cloud layers.)

Sulfuric acid is also a solvent like water. (It even dissolves SO_3 itself, to give "oleum," a complex mixture of polysulfuric acids.) Like water, sulfuric acid is highly polar and hydrogen bonded, with a high boiling point (about 337°C) and *huge* liquid range (over 325°C). . . .

A heavy, oily, corrosive, malignant sea. It not only dissolves most everything in sight, it *reacts* with most everything in sight. You'll have intense chemical weathering of minerals, with metal ions leached from most silicates. So the sea will be highly "salty": lots of metal ions will be in solution, to the point that sulfates will probably precipitate out, the way salts precipitate from extremely concentrated brines on Earth like the Great Salt Lake or Dead Sea. Like such brine, the H_2SO_4 sea simply couldn't dissolve anything more.

Besides sulfates, quartz (the com-

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mon, stable form of crystalline silica, SiO_2) would be one of the few survivors among common Earth minerals. Other refractory oxides, such as periclase (MgO), lime (CaO), and corundum (Al_2O_3), which are rare minerals on Earth, would also be stable. And maybe a few other salts . . . but overall, the surface minerals will be *very* different from Earth.

(There'd be no carbonates, either; they react effervescently with any acid to give carbon dioxide. The standard field test for limestone is to drip HCl on it and see if it fizzes. So, all the CO_2 will go back into the atmosphere, which could make for an awkward greenhouse effect.)

At first glance, a more hopeless medium for life seems hard to find. H_2SO_4 reacts enthusiastically with most organic compounds. . . . it dehydrates sugars to carbon and water, it breaks down many organic acids, it lyses ethers and esters, it attacks carbon double bonds to give alkyl hydrogen sulfates. . . .

But it doesn't react with some other organic compounds. For example, alkanes (straight-chain hydrocarbons), even halogenated alkanes, just bubble right through. (A property used by the oil biz to purify them in refining.) So all this says is that, once again, an alien biochemistry will need different building-block compounds. It doesn't say it's impossible.

There are silicones, for example, a class of compounds famous for high-performance lubricants and starlet bosoms. Bastard children of silicates and organics, silicones are not known to occur naturally (so far, anyway). They have a silicate backbone:

-Si-O-Si-O-Si- etc.

which can even be branched, and which looks just like the chains in many silicate minerals. However, organic chains are hung off the sides of this backbone, methyls or ethyls or a bunch of other things, and the combination is synergistic: Silicones are stable, even in corrosive environments, and they have complex chemistry, maybe even complex enough for life.

And sure 'nuff, in SF silicones have occasionally starred in alien biochemistries. In *Uller Uprising,* for example, H. Beam Piper postulated life-forms based on silicone chemistry. He attributed the evolution of silicones to an abundance of silica and dearth of limestone on the planet Uller, so that the seas were supposed to be solutions of sodium silicate, "water glass," the soapy compound used for preserving eggs, sealing concrete, and other miscellaneous purposes. (In my research, we use sodium silicate solution for holding friable geological samples—i.e., dirt—together.) All this silica then made it easy for it to combine with organic compounds to make silicones.

Unfortunately, his chemistry was amiss. It would be hard to find a world richer in silica than the Earth. Limestone, calcium carbonate, exists, to be sure, but it's not all *that* common, especially in Earth as a whole. Fundamentally, limestone just comes from the reaction of CO_2 in the air with calcium in solution. Now granted, the carbonate

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cycle on Earth is complicated and subtle in detail, but that's what it boils down to. If you've got carbon, it's hard to avoid having limestone!

Sodium silicate solution is just not stable under high-silica conditions. (It's stable under high *alkali* conditions, which leads to a different set of problems.) Excess silica eventually shows up as quartz, which is very stable, very insoluble, very durable, and one of the most abundant minerals on the Earth's surface. It makes up most of sand; most beaches are almost pure quartz.

But—all these chemical difficulties can probably be avoided on a planet where nearly all minerals are broken down at the surface by an exceedingly corrosive ocean. A sulfuric acid ocean, for example.

The sulfuric acid planet is also obviously a highly oxidized planet. If some organism evolved oxygen-releasing photosynthesis, the atmosphere could accumulate free oxygen, since sulfuric acid is hardly going to burn. So maybe something like the highly oxygen-rich atmosphere of Earth could evolve, to support complex, multicellular organisms like Earthly metazoans.

But there'll be *big* problems with technology. Even if an intelligent species evolves, what's it going to do for metal? Some noble metals—silver, gold, platinum, a few others—don't react with H_2SO_4, but they're rare. And they're not very strong anyway; try making a knife or a shovel or a sword out of gold! Iron, copper, bronze—not to mention aluminum or magnesium; all dissolve enthusiastically in H_2SO_4. The aliens will just have to settle for ceramics as tool materials.

(The noble metals *are* good electrical conductors. Maybe the intelligent beings can develop electrochemistry, using ceramics for vessels! They won't be able to build massive machinery, though, so generating the electricity may be a problem.)

In fact, such hurdles on the way to a technological civilization may be a contributor to the Fermi Paradox. Maybe intelligent life is, after all, relatively common; but intelligent life able to develop spacefaring technology is exceedingly rare. The chemical environment just doesn't cooperate.

Sulfur. Even if not on Io, Somewhere Out There. . . ■

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THE ANALYTICAL LABORATORY

Thanks once again to everyone who voted in our annual poll on the previous year's issues. Authors and artists always appreciate your thanks when they do an especially good job of entertaining you, and this is the most meaningful way I know for you to convey them. The more votes we get, the more meaningful it is.

The feedback your votes provides also helps *you.* It helps us keep aware of what you like, so we'll have a better idea of what to offer you in the future.

To review the procedure, we have four categories: novellas and novelettes, short stories, fact articles, and covers. In each category, we asked you to list your three favorite items, in descending order of preference. Each first place vote counts as three points, second place two, and third place one. The total number of points for each item is divided by the maximum it *could* have received (if everyone had ranked it #1) and multiplied by 10. The result is the score listed below, on a scale of 0 (nobody voted for it) to 10 (everybody ranked it first). In practice, scores run lower in categories with many entries than in those with only a few. For comparison, I've included in parentheses at the head of each category the score every item would have received had all been equally popular.

NOVELLAS AND NOVELETTES (0.56)

1. "Labyrinth," Lois McMaster Bujold (2.22)
2. "Humanity Test," Charles Sheffield (1.95)
3. "The Mountains of Mourning," Lois McMaster Bujold (1.80)
4. "The Gentle Seduction," Marc Stiegler (1.43)
5. "The Nearly Infinite Possibilities of Junk," Stephen L. Burns (1.26)

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SHORT STORIES (0.50)

1. "The Happy Dead," Amy Bechtel (1.52)
2. "Soul of the City," Michael F. Flynn (1.44)
3. "The Best Is Yet to Be," Lyn Murray (1.42)
4. "Little Monsters," Amy Bechtel (1.17)
5. "Gridlock," Michael McCollum (1.14)

FACT ARTICLES (1.54)

1. "The Ape-Man Within Us," L. Sprague de Camp (3.20)
2. "Zero Gravity and the Immune System: A Challenge to Man's Survival in Space," Dr. J. Kevin Steele (2.50)
3. "On Building an Earth-like Planet," Stephen L. Gillett, Ph.D. (2.31)
4. "Hypermedia and the Singularity," Marc Stiegler (1.91)
5. "The Economics of Interstellar Commerce," Warren Salomon (1.83)

COVERS (1.54)

1. April: Todd Cameron Hamilton, for "The Gentle Seduction" (3.02)
2. March: Nicholas Jainschigg, for "Nothing in the Night-Time" (2.91)
3. July: Kelly Freas, for "Cold War" (2.34)
4. October: Nicholas Jainschigg, for *Sparrowhawk* (2.32)
5. August: Kelly Freas, for "Labyrinth" (1.84)

You may have noticed that several very talented new writers who happen to be women have carved *Analog* niches for themselves in the last couple of years, and two of them earned the lion's share of top honors in our short fiction categories, Lois McMaster Bujold placed not only first but also third among novellas and novelettes; Amy Bechtel had both first and fourth-place short stories. Kelly Freas, a long-time *Analog* favorite, won two of the top five cover places, while first place went to a young and multi-talented follower in his artistic footsteps, Todd Cameron Hamilton. Competition was quite tight near the tops of all those categories, while the fact articles had a runaway winner in L. Sprague de Camp's "The Ape-Man Within Us."

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George W. Harper

MADUMMUDRA'S WORLD

William R. Warren, Jr.

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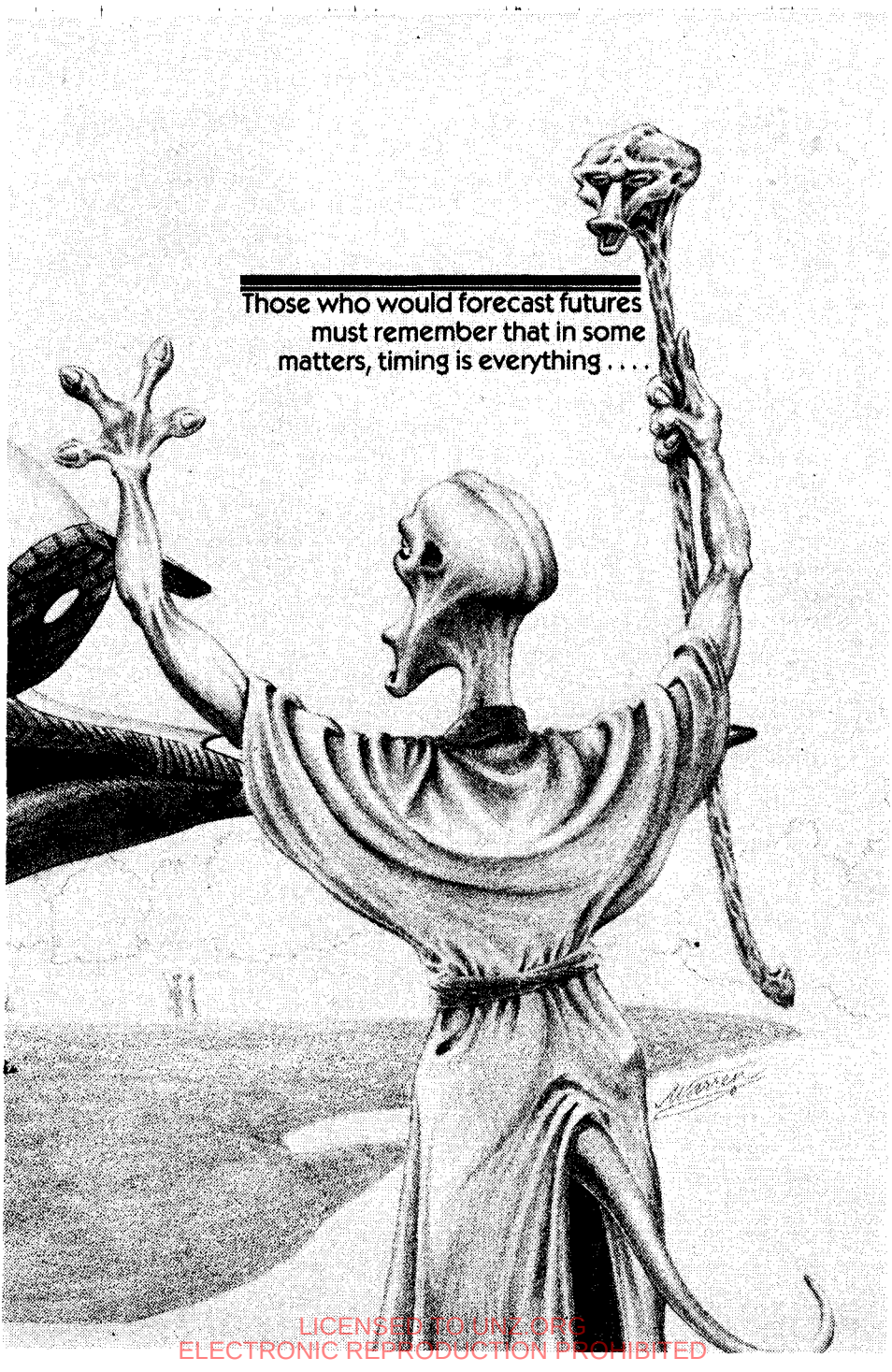

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Not for the first time that morning Galbul Madummudra-Um-mel-Nausivida glumly surveyed the long line of foragers loosely strung out along the river bank. Nearly two hands of hands were out today, but only a few could be seen bending over harvesting the ripe awns at any given moment. It was not a good omen to be finding so little so late in the warm summer.

Life was always filled with troubles, but this season had seen more than he could recall experiencing during any of his over three hands of seasons and one hand as Galbul—literally "Big Balls"—of the Sqraey Tribe. The seasonal rains had come late and had been scanty. Whole sections of marshlands had dried up alongside the river banks and cracked, parched clay covered the places where the life-giving lakvah plants normally grew.

With the failure of the rain the herds of gnaur beasts had fled toward the red lands further upstream, lands inhabited by the powerful Makkan people who would never permit the Sqraey to hunt there.

The clan had grown by more than two hands since the end of the last rainy season but this season's harvest was sure to be small, so many would be called to feed the gods before the rains returned for the next season.

Mentally he ticked off the names of those who should be sacrificed first. There was old Murvisida-Goz-mel-Liullemmuni. He was almost helpless after having had his leg mangled by one of the tchaki gods who lurked in the river to devour any unwary ones who came to drink of its waters. Then there was his own dam, Anmur-vin-Zursaglil-vin-Uma, the tribal memory. He disliked the thought of giving her blood to the gods as payment for water from Tiannum, but she was old and Aliul-vin-Emmuni-vin-Soghda was well trained and could recite the history and genealogy of the tribe without error. If the Sky God was truly angry only a rain of blood would perhaps appease his wrath and pursuade him to rain water down upon the people of the Sqraey, that great winged bird god which soared higher than the eye could see and who was the messenger of all the gods above. By sacrificing his own dam he would show Tiannum how desperate was the need of the people.

Ninety-four of the people were ranging out in search of ripe lakvah plants to be brought to the communal pot. Another dozen, mostly females with newly whelped cubs, tended the camp site half a day's trot from the river's banks and saw to the children. A child was a cub who had lived his first full cycle of the seasons and was therefore given a name. Fewer than three in every ten whelpings survived that long and it was very unlucky to start investing affection on one who would probably perish before he became a person; so the cubs merely fed from the dugs of whatever female happened to be nearby and otherwise were mostly ignored. Nor would the gods accept cubs as sacrifices. Until they became people they were not worth anything.

But two of the cubs would be named after the god Colpuet set behind the western edge of the land, to be seen no more until his rebirth in the spring. They

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could be sacrificed then. That would reduce the number of mouths by almost a hand. Another cub would be named when Kaskakumum rose in the eastern sky just as the great light of Hnup set in the west. This would complete one hand, assuming the cub lived long enough.

But more sacrifices would be needed if the tribe was to survive through the coming season and endure until the first plants sprang up in the ground, many more. At least five hands of people . . . one hand with each return of the Face of Ynanna. That way they could boil the flesh away from the bones after their blood had been offered up and the people could nourish themselves at the ritual feast while still leaving the bones to bury as befitted people of the Sqraey.

Of course there was himself. He was long since resigned to the inevitability of his own sacrifice when the time came for the rains of return. That was the fate of every Galbul once his powers began to wane or it became evident the gods had grown displeased with the tribe. He was not the Galbul, the "Big Balls" of the tribe, for nothing. The gods had ordained this as the fate of every Galbul from the times before even the tribal rememberers knew; from the days when the people had been shaped from the mud of the land and life had been breathed into them by the great artisan Humtulilap in order that they should serve the gods.

Not by the wildest stretch of his imagination would the Galbul Madummudra-Um-mèl-Nausivida even consider evading this ultimate responsibility to his people. But first he must decide which others of the tribe should die. And this was no simple task. Theja'adan-Laq-mel-Nancililiamum was their best hunter, but he was even older than himself, having lived almost four hands of seasons. Would it be best for the tribe to sacrifice him because of his age and leave the tribe with younger, less experienced hunters for the coming season, or should he sacrifice a younger hunter and preserve Theja'adan's hunting skills for another season?

The seasons's whelping had left the tribe with almost two hands of cubs, several of them sturdy and likely to live to their naming. That meant he could probably sacrifice a hand of the sicklier children. They wouldn't provide as much nourishment for the tribe as some of the fatter, healthier adults, but that couldn't be helped. He could make it up by sacrificing two of the fattest females and three of the poorest hunters. That would bring the total to three hands, plus one to be added to the next hand after he counted himself.

The effort of calculating all these numbers and telling them off on his fingers wearied him. He had on occasion arrived at a dim realization that there ought to be some better way of calculating than hands. Once, as a child, he had thought to count the gods of the night sky but was defeated when he reached two hands of hands. The old Dashur Entummum-Adjar-mel-Shapturmmum, who was voice of the gods and knew the names of each had once confided to him when he was but a child that one could count even higher, to as many as hand and feet of hands and feet, but somehow the Galbul had never been able to accept the idea. Hands were made to count with, not feet.

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The sound of excitement among the more distant of his people roused him from his thoughts and he sprang instantly to full attention. Probably a party of foragers from some other tribe was his first thought. With the supply of grasses so low there could be no thought of sharing; not this season. If they met with another tribe it would be war to the death, with the survivors eating the dead of both sides.

Beckoning to his security party of warriors, whose responsibility was the foragers' safety, he formed them into a compact mass behind him and trotted rapidly in the direction of the disturbance whilst slipping his wicker shield from his back to one sinewy arm and gripping his war club tightly in the other fist. If it came to war, whoever they encountered would discover the Sqraey Tribe was no mean foe.

Almost as soon as he started the Galbul realized that this was no ordinary event. His people were staring not at the ground but high into the sky, at what first appeared to be a large Sqraey newly arriving from the place of the gods. But then he sensed that this was no ordinary Sqraey bird. Even as he gazed in consternation the Sqraey was looming ever larger, yet he could see no motion to its wings. Truly this must be the very God Sqraey Himself coming down to meet His people!

Something must be terribly wrong with the world for the God to come in person!

"Hold it!" Doc shouted up from the fishbowl, "I think we may have something!"

"What've you got?" Jeremy demanded quietly. He had been flying *Quizzer* on manual for the past four and a half hours as they cruised first one potential site and then another, all to no avail. At first it had been a welcome relief from the cut-and-dried routine of space flight but by now he was tired and more than a little discouraged. During all that time they had found not the slightest sign of anything that might be regarded as intelligent life, and hourly he was becoming more convinced they would never find any.

"Far side of the river," Doc answered a bit more quietly, "About fifteen or twenty klicks at 10 o'clock. Looks like what might be a line of hunters or foragers."

"I've got 'em in sight from the greenhouse," Heam volunteered. "I think you may be right, Doc."

"Yeah. I see 'em now," Jeremy agreed, then added, "Been too busy trying to fly this tub to pay much attention to stuff on the surface. Do you want me to back off so you can study 'em from a distance?"

"Not necessary. Slow it down so we can get a good shot of the thing for the records and then come right in over the top."

"Hey, I thought we weren't supposed to interfere with the development of any primitive culture?" Kirby objected from the engine room.

"This wouldn't be interference," Doc assured him quickly. "They'd be so primitive at this stage that a quick visit won't make a bit of difference. . . .as long as we don't go trying to teach them about bows and arrows or goodies of that sort, which could chop

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a thousand years or so off their development time."

"OK," Jeremy said, "What's the drill on our approach?"

"Cut back to maybe seventy-five klicks. Make a circle away from the group and head back over them at an altitude of around one hundred meters. I want to see how they react. That should give us an idea of how intelligent they are."

Cutting back on the throttle and banking the ship around as he dropped the nose slightly, Jeremy sang out, "Going around. Stand by for maneuvering."

The God was moving more swiftly than he had ever imagined possible, Madummudra decided unhappily. Sqraey must be very angry with His people. Verily, this was a swiftness more than that employed when he dove in quest of the chuppukah animal! But if he was angry there was naught the Galbul could do but accept his punishment. It was his responsibility as the leader of his people, and no man could argue with the gods.

Already some of the more fearful of the tribe were cowering in terror at the apparition. Never within the lore of the tribal memory had a god actually deigned to visit a tribe. And the memories of the various totems regularly exchanged knowledge of things whenever two tribes met in peace.

Swifter than the swiftest of flyers was the approach of the God . . . and ever larger was His form. Even at a distance He was greater than the greatest river kaf, that behemoth whose carcass would supply meat to the tribe for two Faces of Ynanna before it became so spoiled that even the stomachs of the Sqraey people could no longer eat of it. Even so the Sqraey God had yet to cross the waters of the Karumma. How great must He really be?

The Galbul was afraid he might soon discover the answer to that question.

Almost abstractly he noticed two of his warriors had fallen to their knees in supplication of the god and almost all of the foragers had done so, too. Perhaps he should also. But no, he decided; it was not yet time. He was Galbul! If the Sqraey God had come to seek out His people the Galbul must greet him, but he must greet him with the appropriate humility due to any god being greeted by a mere mortal, no matter how great the dignity of the mortal.

Even as he considered these thoughts the Sqraey God began His crossing of the Karumma. There was no longer any doubt. The God had sought out His people and was coming to meet them! The only question was whether He was coming out of pity for their wretchedness or in anger at some misdeed committed either by the tribe or by their Galbul?

Being a practical man, one moderately versed in the ways of the gods, Madummudra - Um - mel - Mausivida, Galbul of the Sqraey Tribe, suspected it was the latter. Although he would never dream of saying so aloud he had a shrewd idea that any time the gods chose to manifest themselves on the land it meant trouble for mere humans.

By now he was almost alone among his tribe in remaining on his feet. The rest were mostly in various stages of prostration, with the majority lying flat upon the ground in abject humility. Off to the side he could see the young war-

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rior Suppiliumna-Uga-mel-Tolullinna still standing but with his head bowed and his arms crossed in salute of the God. Pursing his lips slightly he nodded in approval. The choice for the Galbul to succeed him lay between young Suppiliumna and the older, more experienced Hiamatullissa-Mogan-mel-Murrasiva. But the latter was down on both knees before the God while Suppiliumna was still erect.

The responsibilities of the Galbul included a reasonable defiance of the gods when necessary. He must be prepared to argue with them in defense of his people . . . even threaten them if need be! How could the sacrifices be made if the gods slew all their slaves? If the tribe starved or was destroyed by the people of a different tribe then who would there be to feed the Sqraey God? If the God did not know this then it was the duty of the Galbul to tell Him so, and Hiamatullissa's unseemly fear might indicate an unwillingness to speak plainly to the Sqraey God when plain speech was called for.

He would have to remember this.

With almost ominous silence the enormous bulk of Sqraey slid squarely atop the Galbul and his band of warriors, blocking out the sun and casting a dark shadow over the cracked, baked mud of the plain.

Hovering quietly with wings outstretched, so high above them that the whole Sqraey tribe standing one atop the shoulders of the next could not hope to reach it, the God was still the largest thing the Galbul or any of the rest of his people had ever seen. It required all his will to merely stand respectfully erect in the face of such awesome power, but he was Galbul; he would perform his duty for his people to the end.

"I'd say there can't be any doubt," Doc announced quietly. "They're wearing skins for clothing. They've got shields and weapons and they're carrying baskets. And most of all, they're bowing down to worship us. What more do you need?"

"You've made your point," Jeremy conceded. "The place has got intelligent life so it's off limits for settlement. Thanks a bunch!"

"I'm just as disappointed," Doc agreed. "It would be a real feather in our cap if we could come back with a nice new planet all ready for human settlement, but let's face it, most places that would be good for humans will be equally good for local intelligent life."

"We know it, but that doesn't make it feel any better," Ellen chimed in. "We can always hope anyhow."

"So what's the next step?" Jeremy asked. "Do we take off for parts unknown or what?"

"Might as well set down and make a few observations from aboard the ship. I'm retracting the fishbowl and heading up to the greenhouse. As far as I know no one has ever observed the psychological reactions of a people as primitive as this so I figure we can spend the rest of the day here before heading out. Any objections?"

"Nope. Not unless the ground proves too soft," Jeremy replied easily. "I'm curious too, and another six hours sitting around watching won't hurt my feelings a bit."

Easing the ship over to a sun-baked area where no natives would be hurt by

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the landing, Jeremy slowly allowed the ship to settle to the surface.

It proved trickier than he had suspected. The landing skids broke through the crust into the soft muck underneath and for a minute he thought he might have to lift off again, but the crust was able to withstand the broadly distributed weight of the ship's belly so he decided to make do. In another minute he passed the order to power down and for the first time in over a year, *Quizzer* was nestled in on the surface of a planet.

To Madummudra, the behavior of the Sqraey God was a mystery. Why should the God decide to descend to the land beside them. If the God wished to slay them He could swoop down at His own pace and take them one by one. What was His purpose? What must he, the Galbul of his people, do in response to this action of their God?

It was puzzling; and there was no one to whom he could turn for advice. He was the Galbul. Such matters were in his province alone and no one could help him.

Motioning the still-erect Suppiliumna-Ugu-mel-Tolullinna to follow, Madummudra nerved himself and strode bravely up to the very face of Sqraey, placing himself directly beneath the awesome beak of his God. If Sqraey was angry with him he was there. No others need suffer for his misdeeds!

Madummudra was not certain what to expect of the God, but he was certainly unprepared for what did happen—absolutely nothing! The Sqraey squatted on the scorched clay apparently utterly content to remain motionless and wait. . . . But for what?

Perhaps something was expected of the Galbul, some act of subservience or special sign of respect. Was he expected to grovel in the dust before the Sqraey God? If so he would do it, but somehow it did not seem fitting that the appointed leader of the Sqraey's chosen people should be required to cower like a common slave in front of everyone. It would not accord with the dignity of the Sqraey God. A leader should stand manly but respectful before his god and man.

A glance from the corner of his eye showed Suppiliumna to be fully as puzzled as he. Madummudra breathed a silent sigh of relief at seeing this. If Suppiliumna had received private word from the god then he would have known precisely what to do and that would have been a sign Sqraey was angered with him; which would leave him with no choice save to open the life stream of his own arm as atonement for his failure.

Madummudra did not fear the Tchaki of Death any more than he feared the Ummanu of Life. Both were part of the way things were so fear was meaningless. But at the same time he was in no rush to speed the process and the fact that Suppiliumna had gotten no sign meant he was safe for the moment, but only for the moment. No mortal ever dared take a god for granted, not for a single instant.

It is right to stand in awe of the mysterious, but fear ought to be reserved for those things which can be changed. It is foolishness to throw fear away by wasting it on that which cannot be avoided. A Galbul knows this even if the people he leads do not. The forfeiture of his dignity, however, was a thing

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to be greatly dreaded. A leader must have pride as well as humility, and for a leader to lose his dignity meant the loss of pride and thus of leadership.

Still, something must be done. Every moment he waited meant further increase in the fear of his people—which was not good. Some fear is right. Too much fear is wrong. The Galbul would not have thought to put it in exactly those terms, but instinctively he understood that excessive fear among his followers would lead to panic and the loss of all authority.

Carefully laying his shield and war club upon the ground, Madummudra crossed both arms atop his chest and respectfully addressed the God. "Oh Mighty Sqraey, Greatest of the Gods and protector of the Sqraey People," he commenced as solemnly as he could. "If we have offended thee let the punishment fall upon the head of Madummudra-Um-mel-Nausivida, thy servant. Hard have been my labors on thy behalf, but what is a man if not a thing drawn up out of the mud: imperfect but still thy creation and thine to do with as thou wilt?

"Know thou, Oh Almighty Sqraey, that thy people are sorely afflicted. For seasons beyond memory thou hast sent thy waters from the sky and thy people have prospered and grown fat. Yet never have we neglected to sacrifice to thee. At each appointed time we have given thee our blood to drink so ye may wax strong among the gods and protect us against those who would slay thy people."

Now he switched to cautious accusation. The god must be told the truth even if it meant his own life, "But each season the waters become fewer, the meat animals and the lakvah plants grow scarcer, and thy people grow ever more hungry. Where once we were many and strong, now we are few and weak. If thou choosest not to help us then assuredly we shall die. Then who will be left to feed thee? Then thou shalt hunger even as we have hungered.

"Answer unto me, Oh Magnificent Sqraey. What must thy people do to avert thy anger and regain thy favor? Your servant, Galbul of the Sqraey People, Madummudra-Um-mel-Nausivida awaits thy command."

"You're the expert," Heam asked interestedly as she and Doc observed the Galbul's display from the greenhouse monitor, "what do you make of it?"

"Well, he's obviously the tribal chief. That we can be sure of," Doc answered judiciously. "As for what he's saying, that's another story. It's pretty certain they figure the ship's a god coming down from on high, so to some extent it has to be an act of worship."

"I know that," Heam persisted with a touch of irritation, "but somehow I get the feeling there's a touch of defiance in his worship. Do you think he may suspect we're not a god?"

"Absolutely not," Doc argued, "All primitive people manufacture gods. They feel themselves helpless and under the control of forces they neither understand nor command so all they can do is try to appease them. . . . and that means they have to accept their own weakness and acknowledge the forces as gods. I agree there seems to be defiance there, but perhaps his people worship a fish totem or something of the sort and he

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regards us as a bird totem so he doesn't quite know what to do about it.

"That your theory or something you learned in books?"

"Straight out of the books."

"Are the books ever wrong?"

"Usually. You've got to remember the books were written by people who weren't there."

"Then it's possible our chief is actually threatening us? Maybe he figures we're demons and not gods?"

"Of course it's possible. You asked my opinion and I gave it. But I never claimed my interpretation was a fact. Anyhow, the line between devils and gods is mighty slim in any religion. And for that matter even the word 'devil' is a corruption of the word 'divine' by way of an Indo-Aryan parent language. But we've got plenty of time to talk about that later. Right now I want to see what our friend intends to do about the strange bird perched on his doorstep."

"Some doorstep!" Heam jeered humorously. "This is about the widest, emptiest plain I've ever seen."

"Ever visited the ruins of Sumer?" Doc asked quietly.

"No. They on Earth?" she replied.

"As far as we know they're the parent Earth civilization from which all the others sprang. It originated in a place very much like this, and probably under much the same conditions."

"Why here of all places?" Heam demanded with a shudder. "You'd think they'd pick an area where there's something to work with."

"Not really. If you've got everything you need there's no incentive to do more. It's when you put people under stress for survival that greatness appears. Necessity is the mother of invention. . . . Ever hear that old saw?"

"Uh-huh. Somewhere."

"These people are faced with the ultimate challenge. If they don't overcome it they perish. If they do overcome it they will go on to create this world's first civilization and the rest of the world's inhabitants will look up to them."

"But how can they hope to create it out of this desolation? There's nothing here to work with."

"There's a lot here," Doc demurred. "You just have to know what to look for . . . you ought to know that. Remember what you did when you were trying to survive in Pod-11?"

"I guess you're right at that," Heam subsided. "We had to do a lot of surprising things to live through it. But what have they got here?"

"Mostly basket grasses and clay," Doc pointed out. "But they can weave baskets to carry clay and build irrigation canals to provide water to raise basket grasses so they can carry more clay and build more canals."

"Thanks," Heam shuddered slightly. "I can't think of a more enchanting prospect."

"Agreed. For this world that's all there is at the moment. In a few thousand years things may be different, but for now what else can they do?"

Madummudra felt like stamping his foot in frustration. Even after his polite speech the Sqraey God refused to do a thing. He merely squatted there on the clay and awed the people with His majesty. Surely there had to be a purpose behind the Sqraey God's appearance,

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which could only mean that his task as Galbul was to find it.

Oddly, once he reached this conclusion he felt immediate relief. His anxiety vanished. The God was not angry with him! Nor was He angry with His people. This realization brought a renewed sense of awe. Obviously Sqraey had somehow put this new awareness into the mind of His servant. He, Madummudra-Um-mel-Nausivida, Galbul of the Sqraey tribe, was being challenged to understand the message of the Sqraey God.

With understanding came the ability to act. Beckoning to Suppiliumna he ordered brusquely, "Take one hand of warriors and put them to every side of Sqraey. Have them keep respectful distance but remember everything they see. The God has told me to attend upon a message, but He has also told me it will be no easy sign to fathom and if we fail He will turn His face from us and we shall die."

Properly awed, the younger warrior hastened to comply as Madummudra preemptorily bade Hiamatullissa to attend him.

When the latter hesitantly approached the god, Madummudra half contemptuously ordered him to return to the camp site and bring the remainder of the tribe to this place on the morrow.

Madummudra had made his choice clear, and the dejected air about him as he departed showed; Hiamatullissa realized it as well as the rest of the tribe. Where before Madummudra had been loath to decide who should be the next Galbul, now the choice was made. Hiamatullisa had failed the supreme test. Worse yet, he had failed it under the immediate eye of the Sqraey God.

Suppiliumna-Uga- mel-Tolullinna would be the next Galbul.

Nor was Madummudra done yet. Summoning two more of his warriors he ordered them to collect the scattered foragers and assemble them before the God but behind their Galbul. It would not do for the very people of the Sqraey God to cower timidly in the distance when their God had come specially to meet them.

It was a privilege to be the chosen ones of the God and they should act like it! Kneel they must, but they must kneel before Him as befitted His awesome majesty, not from afar like skulkers fearful lest they be seen! Were it otherwise the God might be ashamed of those who were after all His chosen people. And what god desired to be worshipped by the unworthy?

Finally satisfied that he had done all the needed things Madummudra returned his attentions to the Sqraey God and began studying Him intently, etching every detail indelibly in his memory for all time.

"Fascinating," Doc muttered softly when he realized what the chieftain was doing, "He's forcing his people to come and greet us."

"That something not in the books?" Heam queried.

"It's not in the books one way or the other," came the abstracted reply. "But reading between the lines I would have expected him to shoo them away rather than bring them together in front of the ship."

"How come?"

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"Most priesthoods like to keep everything a deep, dark secret. Make it mysterious and act like their god doesn't want to mingle with the unconsecrated. Here he's literally driving them to meet us."

"Maybe it's because he's utterly certain he is face-to-face with God?" Heam ventured. "If you're not really sure what you're preaching about is true then you want to make it as mysterious as possible so nobody can question you. But if you honestly believe then you can afford to make it public."

"You may be right," Doc agreed, "But I'll tell you this for sure. When we get back to Earth and the tapes are passed around they'll create a sensation. No modern man has ever before been given the opportunity to observe the protocols of a truly primitive religion. It'll make me the most famous xenologist in history."

"You really care about such things?" Heam questioned him quietly.

"No. Not the applause; that's for fools. But it sure is nice to know I was lucky enough to be in the right place at the right time."

"Fair enough," Heam nodded thoughtfully. "I can buy that. I'm glad I could be here, too. If I was watching it in some classroom at the Academy it wouldn't be the same. I wouldn't care two whoops that Joe Smith became famous for bringing it back but I'd sure as hell envy him for having been there to see it."

"Same thing," Doc answered easily.

"So what do we do now . . . just sit here? Or do you have some joker up your sleeve?"

"Not a joker in the deck. My sleeve's as empty as yours," Doc assured her. "As an apparition of a god we'll be forgotten in a century at the most. But if we do anything specific we may wind up changing their entire future history. We wait. Give the Skipper a few hours to rest up, then around sunset or maybe dawn if we just want to enjoy the scenery, we take off and disappear forever."

"Seems almost anticlimactic," Heam considered.

"We want it to be. What do you expect us to do, vanish in a puff of smoke or something?"

"You're right, but it would be fun to do something to shake 'em up a little more when we go."

"You just put your finger on the reason for the noninterference rule," Doc smiled a touch maliciously. "One hour on the ground and you want to do something spectacular. How many people do you figure could resist the temptation, and what would that do to the local culture?"

"You've made your point. I'll shut up and let you go about your business," Heam giggled, then added, "I guess I'm just an old busybody at heart."

Madummudra was a patient man, no impatient person could become a true Galbul. But there are limits to patience, and he was approaching his. The sun was not far from his entry into the cave of darkness and the Sqraey people had yet to gather food for the morrow. Too much of this and they would be seriously short even for their present needs, let alone their needs for the coming cold and dry time.

Surely the God must do something before much longer. If not then he, a

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mere mortal albeit the Galbul, must hazard the wrath of his God and take matters into his own hand. It was his duty to the people.

Just as patience was nearly spent and he would be forced into action, the Sqraey God awakened and bestirred Himself. A low noise of power unlike anything any of them had ever heard seemed to pervade the air about them. A shivery look rippled over the body of the God, as if He was freeing Himself from the land about him. Simultaneously a low moan of abject terror coursed through the assembled ranks of the Sqraey people and all, save himself and Suppiliumna, prostrated themselves upon the ground with eyes averted lest they see their approaching doom.

A final shudder and the sleek mass of the God shook loose from the ground and soared aloft with effortless grace. For the space of a dozen heartbeats Sqraey hovered, wings outstretched as if sheltering His chosen people, then in a moment He folded His wings back until they and His tail became one. Then to complete Madummudra's discomfiture the God moved straight up at a pace which defied understanding and without using His wings at all vanished into the abode of the gods, all in the space of no more than forty or fifty heartbeats.

"That's it, guys and gals," Jeremy called over the intercom as they cleared the last wisps of atmosphere and oriented the ship toward their next destination. "Three months and two days before we see another star. Five months and eleven days and we'll make the turn and start heading home."

"Wonder what they thought of our going?" Heam speculated as they clustered in the wardroom for dinner that evening.

"Awestruck, of course," Doc opined a trifle smugly. "After all, how many people have ever been privileged to see a god in the flesh?"

"Flesh I'm not so sure about, lover," Kunella laughed as she wiped a smear of food from John's mouth. Almost three years old and he had yet to master the art of delivering a morsel of food directly to his mouth without intermediate stops at various portions of his anatomy. But she had to admit he was definitely getting better at it. "It's more like seeing a god in the titanium."

"There you go being technical again," Doc chided his mate gently. "Woman, when will you ever learn not to deny a poet his metaphors?"

"A poet you ain't," Kirby corrected him with a sly wink, "Poets can't go around acting pompous."

"You sure we haven't caused any damage?" Heam persisted. "Seems to me we made a powerful impression down there."

"Take my word for it," Doc replied grandly, "They'll have forgotten all about it in a century at the most."

He could not have been more wrong. Doc did not often make mistakes, but when he did make one it was usually a whopper. This was one of those occasions.

Scarcely had the Sqraey God vanished from sight than Madummudra forced reluctant feet to carry him to the spot it had just vacated. There must have been a message, but for the life of him he could not perceive it. Why should

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the God come down and tell him he must discover His purpose and then leave beforehand? Was it perhaps that the God had wearied of the foolishness of His servant and had returned to His abode without fulfilling His plan?

More than ever he was left with a feeling of frustrated bafflement. Almost unconsciously Madummudra found himself looking down at the spot where the Sqraey God's feet had broken through the crust and had sunk into the soft mud below. A thin trickle of water was already seeping up to fill the two parallel tracks, each thirty meters long, a meter and a half deep, a meter wide and separated from each other by a distance of ten meters.

Well into the darkness the Galbul stood there contemplating the mystery of the day and occasionally glancing at the two tiny lakes created by the departed god. Later he laid down on the spot and sought a sleep which was unaccustomedly long in coming. The events of the day had been so extraordinary he could not help but mull them over in his mind, seeking first one way then another to decipher the will of the Sqraey God.

Ultimately sleep did come, and with it came the ability of the subconscious mind to solve the most complex problems without interference from the crude imperatives of the consciousness.

The solution to his problem came in the form of a dream. . . . a dream in which the Sqraey God returned time and again, on each occasion landing in a different place until the whole plain was crisscrossed with water-filled ditches, each with the sacred lakvah plants springing up around it.

With a start of surprise he awakened to discover he had been asleep but a few hundred heartbeats and the night was scarcely advanced. But now he knew! The Sqraey God had not abandoned His chosen people. Instead of merely telling them what must be done He had shown them in the most unmistakable way; and then had finished by sending details of the answer to Madummudra in a dream so that his authority as Galbul would not be undermined by letting all his people know as one.

Truly Sqraey was a most subtle god! Madummudra was proud to be Galbul of His tribe.

Come morning he collected his people to show them what must be done. "The God Himself came to me in a dream last night," he began when they were assembled. A low moan of awe swept through the ranks at this announcement and Madummudra allowed himself a tiny glow of pride before continuing, "He showed me what must be done if the Sqraey tribe is to survive. Now I am to tell you.

"First," he began by making a gesture around the indenture left by *Quizzer*, "Know that from this day forward this is the most holy of places, a place where no man shall set foot save those who have been blessed before Sqraey. We must take the mud from the land and build a mountain even as great as the mountain of Sqraey so that all may know His magnitude. We must build the mountain in the form of Sqraey so that when the work is done no unsanctified foot can tread upon the spot blessed by the god.

"This shall be our first task."

"Now for the others . . . See how the water has risen in the two tracks

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where the God's feet delved into the mud? The lakvah plant grows only beside the water. The God has told us to dig tracks like those He dug for us and let the water fill them until they are full. Then we must place the lakvah plants beside the water so they will grow and give us food and stems to make baskets to hold the food they give us."

"But if we do that how shall we protect our lakvahs from others who may come to steal them from us while we forage?" one of the older women asked a touch querulously.

"Hush mother," Madummudra replied politely, "This, too, has the God shown me. We must make ourselves shelters nearby so that we can protect what is ours. When the hunters and foragers go out we must leave some behind for the safety of our things. That way we can do both."

"May this humble one speak?" Suppiliumna asked diffidently in a tone which clearly implied that he had some suggestions to add and had no wish to impair the authority of the Galbul.

Madummudra could afford to be generous. After all, his actions of the day before amounted to a clear choice of this warrior as his replacement when the time came for him to be sacrificed. If Suppiliumna had anything useful to say it would be to both of their benefits.

"Speak," he commanded simply.

"Many of the tribes living along the water have nearly our number of warriors, and if we divide our forces too much we will have both undefended. If we could capture alive a few of the tak beasts young and close them in so they cannot flee, then we would have the flesh and hides we need close at hand, and not be made to split our warriors in two parts and leave our place only lightly defended."

"This is good. I must think upon it," Madummudra replied solemnly. More than ever he knew his choice had been right and that Suppiliumna should be the next Galbul. He just couldn't see how the tribe could do all those things at one time. There was food to be gathered for the coming season. That must be done or no one would be left to do the god's bidding. They must build a camp for themselves in which the people might live for many seasons without moving. They must draw the sacred precinct and begin building the mountain before it was weathered away by wind and rain. They must dig ditches to be filled by the water rising up from the deeps beneath the land. They must collect shoots from the lakvah plants and place them by the water so new lakvah plants might grow there to nourish the people.

Already his mind was visualizing a rampart of mud which would protect the Sqraey people from raids by other tribes. He could imagine each man building his own wall within the great rampart so an enemy who breached the rampart would have to fight his way over hands of hands of smaller ramparts within the sacred precinct, and perhaps, if the worst came to pass, the people of the Sqraey could retire to the top of their holy mountain where no other tribe might reach them.

Another idea struck him. . . .Surely the Sqraey God was even now speaking to him for never had new thoughts flowed so swiftly one upon the other. "Our most skilled basket weaver is Ninannur-vin-Hatusillu-vin-Ognulla.

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"From this day she must serve the God. Let a great basket be woven in the shape of the god so that in times to come all shall know His form. Let the basket be filled with mud and let mud be formed atop the basket in order that it may endure. And let a place be put atop the mountain to hold the God . . . a place where the winds and rain cannot affect it. And let our mother Minnunur-vin-Hatusillu-vin-Ognulla select from the young females those who will follow after her when the Tchaki God calls for her.

"All these things must we do."

"But how can these things be done when we are so few and must eat?" demanded one of the younger foragers—one of the lazier and more worthless of them at that. It was the sort of question Madummudra had learned to expect of him.

"God does not ask of us that which is beyond our strength," Madummudra replied loftily, then added with more than a touch of maliciousness, "Now you and two others are to be the ones who dig new ditches. Let each ditch be as the ditches dug by the God. Let them be spaced apart as the God spaced His apart. And let them be as deep as the God made His deep and as long and wide as His were long and wide. One ditch each day you shall dig. And on the next day you shall each take up two hands of the wild lakvah and place them in the wetted mud next to the ditch. This shall you do until I order that you no longer must do so."

"But how are we to dig?" the man insisted.

"You could use the shoulder bones of the gnaur animals," suggested Suppiliumna after a cautious look at Madummudra for approval, "And you can use your foraging basket to carry the mud . . . and the mud can be brought to this place to begin shaping the mountain."

Nearly five centuries would pass before the overstretched resources of Earth again visited Madummudra's planet. In the glacial slowness of stone age technology five centuries is as the blink of an eye. Under normal circumstances the new arrivals might have expected to discover at most a scattering of small, ten and twenty family settlements eking out scanty survival on the banks of the great river.

What greeted them was a massively battlemented metropolis of more than 60,000 built around a gigantic temple ziggurat constructed in a crude but unmistakable outline of an ancient Terran reconnaissance spaceship. Hundreds of kilometers of canals and irrigation ditches lined the river banks on both sides, as far as the eye could see, and massed armies of slaves taken from tribes as distant as the remote mountains where the river was born toiled endlessly to construct ever mightier works of art and artifice.

Dozens of satellite villages boasting populations ranging from a few hundred into the several thousands dotted the landscape, and a series of heavily manned frontier cantonments and minor fortifications guarded the perimeter of the burgeoning Sqraey Empire.

Argosies of sturdy boats sailed the river and the sea into which it emptied, bearing cargos of timber and spices, massive blocks of stone and even a pre-

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cious few metals gleaned from all parts of their world.

Safely beyond the limits of the power of the City of Sqraey bands of refugees from the armies of the Galbul applied the arts they had learned to the construction of their own cities. Farming and animal husbandry had taken root everywhere up to a distance of two or three thousand kilometers from Sqraey, and where once men had been forced to war with clubs and baked clay pellets cast from slings, now they fought with lance and arrow. A few bronze swords were clasped in the hands of the officers and artisans were now experimenting with an even stronger metal called iron.

High priests within the Temple of Sqraey preached the need of sacrifice to Him who had made His chosen people masters of the world, and proclaimed endless rituals required to perfect the Law of Sqraey and to insure that His Face should not be turned away from them.

Already distant thunders of a priestly jihad might be heard in the land as the more fanatic believers had begun proclaiming that there was no God save Sqraey and demanding that every disbeliever be put to death lest their want of faith tempt the weak into corruption and thus cause Sqraey to visit punishment upon His chosen people.

The highest of the high priesthood had begun living in grand palaces constructed of stone and timber brought from the most distant reaches of the world. A powerful, arrogant, priestly bureaucracy bestrode the land enforcing ever greater exactions upon the peasantry, entailing their lands and slowly driving them into slavery.

Lesser priests within the temple confines had created a crude system for keeping tally of all the grain, the wealth and the booty being imported almost daily into the city. It was not yet true writing, but in another century it would be. Already there was a fairly advanced mathematics and geometry—the latter essential to determine landholdings after the floods which periodically swept the land; the former to keep precise records of the produce and tributes brought in to the temple precincts.

A few minor priests had actually developed a crude system for keeping track of the seasons and of the wandering godlets who attended Sqraey as His special messengers in the heavens. Publicly praised, though privately jeered at as "impractical dreamers," these obscure sky-watchers were successfully laying the foundations for what would one day become the "science" of astrology and perhaps later the true science of astronomy.

The Galbul Madummudra-Um-mel-Nausivida and his successor, the Galbul Suppiliumna-Uga-mel-Tolullinna had been all but lost in a cloud of myth. Madummudra, so the priests related, had been sent down to Earth by the Great God Sqraey as his Chosen One to bring civilization to the world. Upon his death he was translated directly into heaven as the special deputy of Sqraey. A few priests even had begun whispering that Madummudra was the actual son of Sqraey.

In his honor the month of the spring rains was now called Madummudra. One day, it was confidently whispered, Madummudra would return to the world to judge those who had obeyed his com-

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mands and had followed all the rituals of the Law. Those who passed his righteous judgment would enter into a hand of hands of hands of years of bliss as a reward for their labors.

As for Suppiliumna, the chosen successor to the Great Galbul, his reward was scarcely less. Upon his death he had been translated into the heavens where for all time to come he would sit at the right hand of Madummudra as executor of his command. In his honor the month opposite Madummudra was forever to be called Suppiliumna so that between them they held the gates for the opening and the closing of the sky.

And at the other extreme, since no religion can exist without evil opposite it, the failed Hiamatullissa-Mogan-mel-Murrasiva had now become the rebellious tempter who had sought to foil the plans of Sqraey and turned his back upon Him at the critical moment. Hiamatullisa, at the head of an army of Tchaki demons, had been waging war against the righteous ever since that long ago day. In His own good time the legions of Sqraey would fight a final battle with the Evil One, and his dark forest of Tchaki, and hurl them into the dust where they would trouble the chosen people no more.

All these developments would have come to pass anyhow. That is the way of civilizations. They must come into being one slow, tortuous step at a time. Nor can any step ever be omitted. But for all Doc's confidence that their visit would lead to nothing, it had still advanced the pace of this world's civilization by more than 3,000 years in the short span of 500.

What he had overlooked, and the ethnologists five centuries after him would have yet to learn, is that the glacial slowness of change in a stone age implies that once a seminal change does occur it must inevitably bring with it an entire constellation of peripheral developments. Let the cake of custom be broken once and a host of new ideas shower down upon the land like a monsoon rain as each novel thought creates a thousand added new thoughts in a psychological chain reaction.

It is safer and leaves fewer ripples on the waters of time to bring a thousand ideas to an old, established civilization than to introduce a single idea to a nascent one. Old, established cultures resist new ideas with fang and claw where a newly a-borning culture clutches each fresh thought to its breast and nourishes it to fruition.

It is the way of things.

But of all this the crew of *Quizzer* knew nothing. They were on their way to the next stellar system and the world of the Galbul was merely a receding memory. They had done their job, and they had done it well. No one who knew the circumstances would fault them for any action they had taken. Only the ignorant and the fearful who always safely hide between four walls at home, where they presume to criticize everything done by those who do venture, would ever dare to carp. But then those types always whine and condemn. In every world and every society the craven stay-behinder is always the most intolerant and the most eager to place blame on others.

This, too, is the way of things. Such people can never be other than what they are. ■

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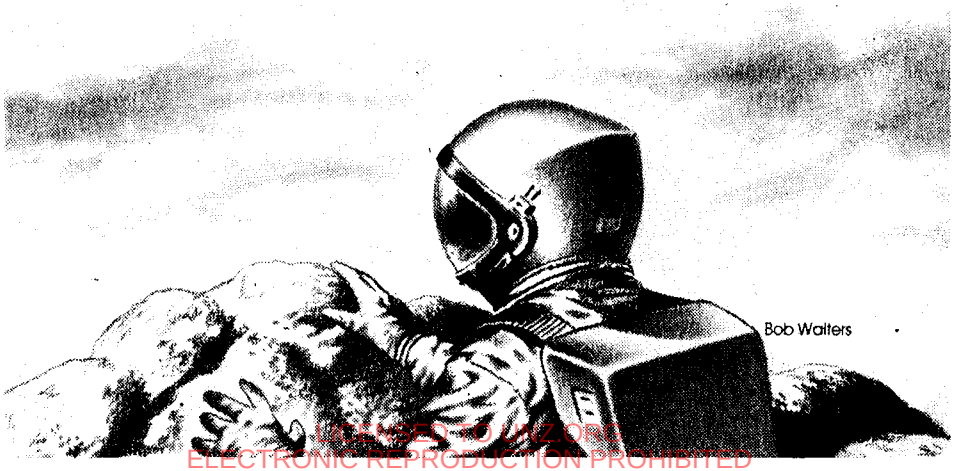
A QUESTION OF BALANCE

Kevin O'Donnell, Jr.

Sometimes it's a little hard to tell where ecological problems end and legal problems begin. . . .



Bob Walters

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With weary resignation, Captain Norman Graczinski yanked his foot free of the reddish muck. It seemed to him that a fourteen-day forced march through the Kragan swampforest should have taught him and his two crewmen how to move without slipping so often, or sinking so deep into the ketchup-like ooze. It hadn't, though. Despite all their attempts to walk lightly, the stuff still sucked at the boots of their surface suits, slurping and smacking with their every step. His legs hurt something awful.

How much longer would it take to reach the dump site? The native "judge" who had convicted them of collective responsibility for illegal waste disposal, and sentenced them to clean it up, had estimated that if they worked hard and well, they could regain their freedom within one Terran month. Graczinski sure hoped so. Their suits would run out of power in six weeks.

He should have stayed aboard the *Sweet Cindy Lou*. Hell, he never should have landed her. He should have aborted touchdown when the sensors reported no signs of impact in or around the ship sending the distress signal. But the likely salvage value of the grounded merchant would have covered the *Sweetsin*'s mortgage payments for at least a year, so he'd taken her down. And disembarked. And . . .

Probably, he thought, ducking beneath a leafless, moss-slimed tree branch, and nearly falling on his face in the process, he never should have bought the *Sweetsin* in the first place. Or else he should have retired from the field as soon as the ship cleared escrow. Owning a three-man salvage tug warped the judgment needed to command it.

Up ahead, little Sandy Kellog screeched an obscenity, then disappeared beneath the surface of a mud pool. The kid's hands went under last. Each flashed the planet Krag the finger as it vanished.

"Sandy!" said Graczinski. "Stay calm. Your suit'll get you—"

"Stay *what?* You motherfuhng sonuva—"

"Turn off Kellog's channel," he told his suit. "I don't need a vocabulary lesson right now."

—Kellog's channel off— said the suit.

Their Zreekull guard/guide, high in one of the umbrella-shaped "trees" whose interwoven canopies made the swampforest a world of perpetual twilight, whooped twice, then gave a hoarse, drawn-out "hirr-hirr-hrai!" It cut through the gloom like a a madman's laugh, or an eagle's screech.

Anger flared in Graczinski, but exhaustion damped it down to dismayed irritation. Just his luck it had to be Kellog who sank. A couple days ago, Seatten had stumbled into a lurehole, but Seatten had been so smashed that by the time he'd stopped treating his predicament as a hilarious stunt, his suit had gotten him almost all the way out. But Kellog? The EVA specialist had no sense of humor, and a very bad temper. He'd probably come up shooting. Probably hit something, too.

God, Graczinski hoped not. All three of them would wind up charged with malicious vandalism or wanton destruc-

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tion of foliage or something equally absurd, and they'd be ordered to recompense the swamp for the damage. How could they do that, though? Replant noxious undergrowth?

Unless, of course, Kellog hit Weiya, the Zreekull guide. Graczinski shuddered. *Lord, if he shoots at Weiya, please make 'im miss.* The pilot/owner of the grounded merchant had killed a lot of Zreekull before his laser pistol had lost its charge. The Zreekull had not approved of that.

Graczinski backed away from the lurehole. His thigh muscles ached. "Des, get away from there."

Destford Seatten, the *Sweetsin*'s nanotechnician, waved a gauntleted hand. Clumsy in his suit, and barely sober enough to walk anyway, he pulled his right leg completely out of the mud and began to pivot on his left foot.

The greasy surface of the lurehole exploded in a tangle of tentacles and thrashing human limbs. Flying mud, the color of rust, spattered Seatten from the back of his helmet to the back of his calves. Off-balance as he was, he pitched face forward, belly-flopped into the gunk, and giggled.

Graczinski gritted his teeth. *Everything's a damn joke to him!*

Weiya the guide laughed again. Wind through the giant trees gave the buzz-rustle-chatter of a surly cabaret crowd.

Graczinski tried to count the tentacles on the merngh, the lurehole's excavator, but it did not stay still long enough for him to distinguish more than five. *I shoulda retired. I had the sense God gave a paperweight, I wouldn't be dealing with a bird, a drunk, and a punk; I'd be sitting at a desk watching a screen add up my P&L statement.* He slogged over to Seatten, who had gotten to his hands and knees but continued to chuckle wheezingly.

A quick glance assured him that Seatten was OK. Not sober, but not hurt. Graczinski shook his head. Fifteen years they'd shipped together on the *Flying Mac*, and he'd never seen Seatten so out of control. Of course, he'd never seen Seatten under this kind of pressure before, but still. . . .

As for Kellog, well, Graczinski couldn't think of anything that could chew through a surface suit in less than a week. The kid might even learn something from the experience, although at the moment Graczinski wasn't sure exactly what. But the damn bird's laughter sounded more and more like a jeer, and that got on his nerves. Looking up into the canopy overhead, he told his suit, "Translate to external speakers."

—Translation on. Externals on.—

"Damn it, Weiya, what's so funny?"

The Zreekull opened his wings. They measured over three meters from tip to tip, with undersides the same cream as his belly, the same cream as the perpetual Kragan overcast. Leaning off the branch, he fell into a lazy spiral that carried him to a spot just beyond Seatten. His long, pointed beak moved. The harsh sound of the Zreekull tongue filled the air.

—Native idioms or Standard equivalents?— asked Graczinski's suit.

"Standard." Ankle-deep in viscous goop, he had no heart for metaphors drawn from the Zreekulls' heritage of flight.

—Standard on.— It started to translate. "Keh walked right into it, Gra.

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Like he didn't even see it. And then Sea—" Weiya brushed the edge of his right wing across Seatten's butt. The gesture seemed gentle, almost affectionate. "You saw him, Gra. He wanted us to laugh."

"No, I din't." Seatten cupped his hands and threw murky water against his faceplate. "I'm gladja did, but if I'da wan'ed you to laugh, I'da hammed it up."

"Des—hands down, damn it." Graczinski stopped, closed his eyes, took a breath. He shouldn't get mad at Seatten for being cordial to their captor, but damn it, it was hard not to. He pulled the hose from his back pack and told his suit, "Give me a fine, hard spray."

—Spray on.—

High-pressure water made a 3-D halo around Seatten's bubble helmet.

Weiya hopped backward. "Hey, careful!"

"What's your problem?" Graczinski resisted the temptation to drench the alien. He had no desire to discover the penalty for that crime. "You dive for dinner all the time."

Weiya slashed the air with his beak. "Only my claws go into the water. I don't get my feathers wet, Gra—and you'd better not, either."

"Yeah. Sure." While the spray sluiced the mud off Seatten, Graczinski watched the wrestling match in the background. It looked pretty even. The merngh had more arms; Kellog, more meanness. The kid also had a laser pistol. Graczinski sure hoped the kid didn't get a hand on it.

Just then the merngh pinned Kellog's arms to his sides, and wrapped another tentacle around his legs. Holding him horizontally as high above its body as it could reach, it bellowed a series of bass notes.

—Unknown dialect.— said the suit.

Graczinski turned to the guide. "Weiya, what'd it say?"

"It's pecked at your buddy. The water in the hole won't look natural for hours, and it's hungry."

"Why the hell didn't you warn us?"

Weiya pulled his head back, opened his beak, and snapped it shut.

The suit said, —Body language: I am surprised.—

"Flyers don't warn walkers." Twisting his neck sharply, Weiya preened the grayish-green feathers along the top of his right wing.

—Body language: Let's talk of other things.—

Weiya faced forward again, and tapped his beak against his belly.

—Body language: And in a more serious vein.—

Weiya straightened. He turned his head so that his left eye focused on Graczinski. "I'm afraid you've committed another crime."

"What?" Every time something went even a little amiss, Weiya claimed they'd broken the law. It was getting to be more than he could handle. If captains of salvage ships could cry without weakening their authority, Graczinski would have bawled. "Why?"

"Gra, you know it's illegal to dump toxic waste in the swamps."

"Kellog is not toxic waste!" He gestured to his immobilized crewman. "And we didn't dump him, he fell in! It was an accident, damn it."

"Consider the possible consequen-

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ces, Gra. If the merngh hadn't evicted him, he'd have died."

"Not in these damn suits." He slapped his chest. "It would've popped a life ring or two and floated him to the surface. He'd have been out in ten minutes, tops."

"If his suit worked. But if it didn't, if it opened a seam instead, that would release your Terran germs into the environment."

"The suits always work." *At least for another six weeks*, he thought.

"Hmph."

"OK, OK, once in a while they glitch, but they repair themselves in half an hour. You've seen it, you know it."

"I'll suspend judgment until later. In the meantime, the merngh wants dinner."

"So?" said Graczinski.

"Feed it." He popped his wings to their full extension, then snapped them back against his sides.

—Body language: Don't even think of arguing with me.—

As Graczinski had recognized the dominance display—Weiya must have flashed it a dozen times a day since the Zreekull had ambushed the three humans inside the lifeless merchant vessel—he just said, "How?"

"About a hundred yards that way"—it pointed with its beak—"around the corner of the purple bush, there's a pod of splashers. Get a big one for the merngh and it'll give you back your buddy."

"Oh, damn. Des, stay here, keep Sandy company. I'll be back."

Through the radio came a swallowing sound, and then "You betcha, Cappie. Hey Sandy? You OK there, boy? Just take it easy, ol' Cappie's—"

"Turn off Seatten's channel and the externals," Graczinski told his suit. "Turn them back on if you receive a mayday."

—Seatten's channel off. Externals off.—

Unholstering his laser pistol, he slogged toward the purple bush. "Read in-suit temperature and relative humidity."

—Thirty-one degrees Cee. Ninety-eight percent.—

"Cut it. Twenty-two degrees Cee. Fifty percent relative humidity."

—Please input ten kilograms of water for the evaporators.—

Another ten kilograms to schlep around? "Never mind." As he had every few minutes for the last fourteen days, he swore he'd never again answer a distress call from the surface of a planet whose dominant species believed in the doctrine of collective responsibility. Not without a grant of total immunity. To do the time for somebody else's crime was not his idea of a successful salvage job.

But how could he have known that a Terran ship had landed on Krag two standard years earlier, and dumped refuse without a permit? Or that since its captain had "evaded prosecution," as Weiya put it, the Zreekull had tried, in advance and *in absentia*, the next party of Terrans to visit Krag, convicted them, and sentenced them to cleaning up the dump site?

The trader sure hadn't known. Two months ago, he had dropped in to inquire about native handicrafts suitable for export. The Zreekull explained how he would be spending his time for the next month or so. He fought . . . and

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killed seventy-three Zreekull before finally running out of ammunition. After trying, convicting, and sentencing him for *that* crime, the Zreekull had used his ship's emergency beacon to lure more Terrans.

One of the few things for which Graczinski gave thanks was that he had forbidden Seatten and Kellog to open fire when the Zreekull had grabbed them. Otherwise they'd have wound up like the trader—and the crew of the next ship in would have had to cut their dung-coated, suit-shrouded bodies down from the trees.

Jesus, they must have flown in formation over him for weeks . . . that poor bastard, just hanging there, his suit keeping him alive until its power failed. . . .

He rounded the purple bush. Half a dozen splashers were rooting in the water just ahead of him. They looked like baby hippos, and did not seem at all startled by his presence.

"Suit, do you have any idea what they weigh?"

Numbers flickered on the inside of Graczinski's helmet as his suit talked to itself. —The nearest one masses approximately eighty-one kilograms.—

Anticipation alone made his back hurt. He walked up to it, brought the laser pistol to bear, and hesitated. "They're not intelligent, are they?"

—Not according to the Zreekull.—

He pulled the trigger. The splasher looked up, blinked once, then collapsed at his feet. The others kept on eating.

He studied the pistol for a moment. Thirteen charges left. Weiya's clan alone numbered what, two thousand? All of them willing to die to enforce their Law? Shaking his head, he holstered the weapon. Then he knelt in the mud and struggled to hoist the dead splasher over his shoulders. After five or ten minutes, he succeeded. In another five minutes, he got to his feet.

The extra weight drove him knee-deep into the ooze.

"Oh, damn." He dropped the splasher. "Transmit to Seatten."

—Transmitting.—

"Des, Norm here. I got the merngh a splasher, but I can't carry it. Ask Weiya if the merngh would come get it."

"Whadja say?"

Patiently, he repeated himself, all the while vowing that once they got back in their ship, he would reprogram Seatten's suit so that its nano-assemblers couldn't make anything more intoxicating than orange juice. "You got that, Des?"

"Yeah. Yeah, I gottit. Gimme a minute. Out."

Graczinski began to tug his legs out of the mire. By the time he had freed both of them, his suit radio crackled. "Cappie?"

"Yeah, Des?"

"The merngh wants dinner delivered."

"Oh, damn. All right. I'll see if I can drag it."

He grabbed a hind leg and started hauling. For once the mud worked with him—the carcass slid along fairly easily, though it kept getting hung up on protruding tree roots. Small flying things gathered, landing on the splasher's exposed side only to leap back into the air when Graczinski pulled. They made a

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bristly sort of noise, like steel wool on a screen window.

Fifteen or twenty minutes later, the lurehole came into view. The merngh held Kellog motionless with two tentacles, and explored the material of his surface suit with another three. Seatten was pacing back and forth, waving his arms as he talked either to Kellog or to himself. Perched on a tree stump a few meters from the merngh's lair, Weiya was preening his feathers. Graczinski stifled a curse. "Give me a hand, Des."

Seatten wobbled over to help. Graczinski almost regretted asking, but the extra pair of hands lightened the load. Seatten only fell down once.

At the lurehole, they picked the dead splasher off the ground, swung it back and forth, and pitched it into the merngh's maw.

The merngh immediately laid Kellog at their feet, and sank below the surface of the water.

"Sandy," said Graczinski, "are you OK?"

"The fuh!" Rage mottled the kid's face. The suit was trying to wipe his nose, but he kept jerking his head. "Lemme kill him, Cap. And the damn bird too, huh?" He sat up and held out his hand for assistance.

Graczinski levered him to his feet. "No shooting, Sandy. I'm not going to spend the rest of my life here just 'cause you've got a temper. C'mon. Let's get a move on."

The trees thinned out, then gave way to reedy, shoulder-high vegetation. Weiya swooped down from the low-hanging clouds and landed beside Graczinski. "There." He pointed straight ahead. "The trash which our court has ordered you to remove. Once it is gone, we'll release you and return your ship."

Graczinski looked, squinted, and told his suit to switch its faceplate to zoom lens status. For an instant, it felt like he was flying over the reeds as smoothly, as quickly, as Weiya himself. The zoom stopped; the image steadied. Graczinski gasped.

Wreathed in mist, rising above the reeds, a slim, one-man starship stood like a finned obelisk.

Graczinski closed his mouth. "Weiya, that's a *ship*."

"To you it's a ship. To us, it's garbage. Remove it."

"Our pleasure." To his suit, he said, "Zoom off; external speakers off; translation off."

—Zoom off. Externals off. Translation off.—

"Guys," said Graczinski, "if that's not wrecked, and it doesn't look like it is, we are going to be out of here real soon now."

Seatten clapped his hands. "That calls for a drink."

"The bastard birds made us walk? If that sucker could land out here, we could have, too, damn it!" Kellog punched his right fist into his left palm, then kicked a submerged, half-rotted log. Small aquatic things darted away in every direction.

"Hey!" Reddish-brown gunk dripped off Weiya's plumage. He fanned his wings and clacked his beak. "Don't wet me!"

Kellog raised his fist and stalked toward the Zreekull. Graczinski stepped between them. "That's enough. Let's go investigate."

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"What is the stuff around the ship?" asked Weiya.

Graczinski peered toward it. "You mean that mist?"

"No, it's not mist. We don't have a word for it, but it's solid. Like ice. Except not cold."

"It's a force fence," said Seatten. "Good fences make good neighbors. Don't fence me in because my grass is not greener." He staggered.

Graczinski took his arm. "Come on, Des. Have some alcoblock, huh? Lay off the booze. We need you sober."

Kellog was still muttering under his breath. As they marched toward the ship, he said, "Jesus, Cap'n. Let's kill the fuhng pilot. He hadn't landed out here without a permit, we wouldn't be here."

"I'll tell you what—get up, Des. That's a boy. Sandy, if there's nothing wrong with the ship, you can blow the pilot away with my blessings."

"Thanks, Cap'n." He grinned suddenly. "You want it quick and clean or slow and dirty?"

Graczinski suppressed a shudder. "I'm going to have to think on that one, Sandy."

As the edge of the swampforest receded behind them, walking became easier. The reeds that fought their every step gradually dwindled in height, as if they needed the example of taller neighbors to reach full growth. Or maybe greater exposure to sun and wind stunted them. Graczinski didn't know, and was too tired to care. To him, what mattered was that while the forest had disappeared, the swamp hadn't. It still clutched at him, still layered his boots with thick red mud. Worse, the sunlight that cut through the reeds revealed the creatures that lived on and in the murky water —creatures, Graczinski thought, that had too many legs, or too many teeth, or both. He watched them as he walked, just in case.

Within an hour they were wading through a vast expanse of thigh-high vegetation. From the air, it might have passed for a lush meadow stripped of its wildflowers. Kellog raised his head. "Hey! The ship's in the middle of a fuhng parking lot!"

Graczinski squinted. Not a parking lot, no. More like the biggest landing pad outside the Terran System, except whiter, cleaner. It had to stretch two kilometers on a side. Not only that, it stood a meter higher than the surrounding marsh. He looked up, to where Weiya soared through lazy circles above their heads. "Weiya! Did your people build that—" he paused to find a term the alien would understand—"that flat place?"

"No." Weiya's voice faded as he turned away. "The metal walkers did."

Half an hour later, they reached the force-fence. An arch opened in the iridescence just above a four-step staircase; a hologram of a Swiss Guard appeared. "Welcome to the shrine of Juan Jacopo Schroeder."

From overhead Weiya said, "That's what it always says. What's it mean?"

Graczinski had his suit provide a translation. To Seatten he said, "Who the hell is Juan whatever?"

"Cappie, I'm having trouble remembering who I am."

Surprisingly, Kellog answered. "He's a Terran. Some kind of banker. Married

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that 3-V star, what's her name, Donna Marie something or other. You know, tall, blonde, jewels in her chin?"

"Oh yeah, yeah. . . ." He asked the holographic projection, "May I speak to Señor Schroeder, please?"

"The Señor is dead, sir. That is why this—" it gestured to the ship in the background—"is known as his shrine."

"Then, um, to whom am I speaking?"

"The shrine's operating system, sir."

Graczinski sighed. He hated dealing with other people's operating systems. His own gave him trouble enough. "I see. Well, it's like this. The natives don't want the shrine on their property. They'd like you to ah, remove it."

The holo grounded its halberd. "Most sorry, sir, but that is impossible."

He hadn't expected anything different, but he had hoped. "Why?"

"The executor program requires the shrine to be established at this spot and to be maintained in perpetuity."

Wonderful. When it came to carrying out the terms of a will, an executor program made the toughest law firms in the inhabited universe look like pusillanimous sissies. The only way to break a will administered by an executor program involved disabling the computer running the program. And that meant—He shook his head. "Why this spot in particular?"

"The Señor financed the expedition that discovered this planet, sir. This is where that expedition first touched down."

Graczinski looked across the dazzlingly white plain to the ship itself. "Was that built as a Federation fighter craft?"

"Yes, sir."

He had thought as much. "And did Señor Schroeder install a nano-tech life-support and munitions-supply system?"

"Yes, sir."

"Uh-huh." He signaled to the Zreekull, who swooped closer. "Weiya, if you give us our ship, we can go to the nearest Federation base and ask the military to get rid of this thing. If they assign a cruiser to the job, they should be able to overwhelm it in about a week. Maybe two weeks. The swamp in the vicinity of the battle will heal in a century or two, and then—"

"No," said the Zreekull. "You get your ship back when it's gone. Not before."

"But why? It's not doing any harm."

"Follow me." Weiya winged around to the far side of the shrine.

Graczinski turned to the holographic guard. "May we cut across?"

"Of course, sir. Step carefully on the staircase."

After two weeks of swamp, solid footing felt good enough to kiss. The guard bobbed along with them, so Graczinski asked it, "How did you build this?"

"The mechs sank pilings down to bedrock, sir, and laid a high-tensile strength diamond mesh across them, leaving sufficient room for the water to flow unimpeded. Then they created The Plaza of Dreams Fulfilled by paving the diamond mesh with nano-manufactured marble."

The Plaza of Dreams Fulfilled? Graczinski shook his head. What kind of dream could four square kilometers of unadorned nano-marble fulfill? For that

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matter, what kind of person would have such a dream in the first place?

Ten minutes later, just as they reached the far side, Seatten collapsed in a heap. Kellog glanced through his helmet. "He passed out, Cap'n."

"Great. Just what we need. Let him lie." With a wave to Weiya, who perched on a mushroom-shrouded tree stump outside the fence, he asked the guard, "Can you make an opening here?"

"Of course." A patch of force-field faded from view. Kellog leaned over the edge.

"There, Gra." Weiya pointed to a placid, reed-free pond five hundred meters south of them. "Do you see?"

Graczinski shrugged his shoulders. "No. What's the problem?"

"The water's been poisoned!"

Kellog pivoted. "Bullshit!"

Graczinski held up a hand to silence the kid. The water looked fine to him, too, but there was no point in arguing. "OpSys, what are you discharging here?"

"Nothing, sir. The systems recycle everything except waste heat, which is allowed to radiate away."

Computers don't lie unless ordered to, and Graczinski could see no reason for anyone to order this computer to utter that specific lie. "Weiya, what do you mean the water's poisoned?"

"See how clear it is?"

"Yes."

"That means there are no worms."

"I don't understand you."

"The worms cloud the water as they wiggle through the mud looking for food. Hatchling fish eat the worms, we eat the big fish when they migrate to sea. No worms—no fish—no food for us. There aren't any plants, either, which means no food for the merngh, who eat splashers and other grazers."

"Fuh's lying," said Kellog. "I just sampled the water. Nothing toxic in it. Usual dissolved gasses, pH neutral, traces of indigenous organics—it's fine."

Weiya let out a yelp and hurled himself into the air.

"What the hell—" said Seatten.

Rain fell like an artillery barrage. Visibility dropped to two or three feet. The drumming on Graczinski's helmet nearly drowned out his thoughts. "External speakers off."

—Externals off.—

"Can you use this rain to cool me down?"

—Yes. Dumping heat now.—

Apparently Kellog was doing the same thing, because the back of his suit began to steam. Graczinski fantasized about stripping off his suit and dancing naked in the rain. How long had it been since his last shower?

No point in standing, though. He lowered himself to the ground and then carefully stretched out on his side. A fascinating view from that angle, as the rain hit the bricks and turned into spray. In the swampforest, the trees had broken the rain's fall, and stretched showers into drizzles. This, though, ah, this was rain!

Some thirty minutes later, it stopped as abruptly as it had begun. The three humans got slowly to their feet. The Swiss Guard still stood in their midst, dry as only an illusion could be.

"Does it always rain like that?" asked Graczinski.

"Yes," said the Guard. "The aver-

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age storm lasts forty minutes and drops 6.1 centimeters of precipitation."

Graczinski let out a slow whistle. "You must have the plaza pitched perfectly. It looks flat, but I didn't see any pooling."

"No, it is flat. If you look at the paving blocks, you'll note that their edges are slightly concave. The small gap between two adjacent blocks serves as a drain—water does not run off the plaza, it runs down through it, directly to the swamp below."

"Nice design."

"The Señor thought of everything."

A host of mechs swarmed out of the base of the ship and spread out across the plaza. Graczinski pointed to them. "What are they doing?"

"Looking for loose paving blocks. The rain is so corrosive that it eats away the cement holding the blocks in place. In time, it will even destroy the blocks themselves."

"Replacing them's going to be fun. You've got what, four—" He stopped, scanned the immense plaza, and nodded. *Four square kilometers of cemented marble blocks. And cement—* He clapped his hands. "That's it! Kellog, you said the water in that pond was pH neutral?"

"Yeah, Cap'n. Why?"

"Suit, do you have a reading of pH levels for normal swamp water?"

—Yes. It ranged from 3.5 to 4.0.—

"Weiya! We found the problem!"

"I'll be there in a minute." The Zreekull's voice came from the only tree within five hundred meters. "Still fluffing out my feathers."

Graczinski spoke to the holo. "As the rain dissolves the cement, it becomes more alkaline. That screws up the ecology of the swamp. Can you design a cement that will not neutralize any rainwater that comes in contact with it?"

"Of course, sir."

"Wonderful! Design it and manufacture it." He broke off as Weiya landed on the stump by the plaza's edge. "Great news, Weiya!"

"What?"

Swiftly, he explained, then turned back to the holo. "So tear up the plaza and chip away the old cement, being careful not to get any in the water. Then replace the paving blocks using the new stuff."

"One moment, please." It faded from view, then reappeared almost at once. "The executor program has determined that the proposed materials substitution falls within its discretionary parameters. The project has, therefore, been approved, and will be complete within the week. Nonetheless, sir, one feels obliged to warn you of its ultimate futility."

Graczinski stared at the holo in disbelief. "Futility?"

"Yes, sir. Although the cement does alter the pH balance of the swamp water, far more alkalinity leaches from the paving blocks themselves."

Of course. Four square kilometers of marble. Fancy limestone, yes? He knew that fatigue had kept him from seeing it right off, but he still felt embarrassed. "So then replace the blocks."

"One moment, please." The image began to thin into formless mist, then clarified just before it vanished completely. "Most sorry, sir, but that is impossible."

"Pardon?"

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"The executor program has determined that such a significant materials substitution lies outside its discretionary parameters. The marble blocks must remain, sir."

Weiya said, "New cement, old cement; new blocks, old blocks—who cares? We want this thing gone, not replaced."

Seatten said, "I need a drink."

Kellog said, "Now can I shoot the little fuh?"

All that night, as he lay on his side in his smelly suit, The Plaza of Dreams Fulfilled cold and hard beneath him, Graczinski racked his brains. He could not sleep. If he failed to convince one side or the other to change its stance, he would spend the rest of his life inside that suit—and the suit's power source would run down in six weeks.

If only the executor program and the Zreekull weren't so far apart. He knew he could get the program to stop polluting the water, but Weiya wanted the shrine removed, and the program would not tolerate that. What was he going to do?

The sky started to lighten. He lay on his back and stared into the underbelly of the cloud cover. What would he do when the air he breathed got as thick as those clouds? Would he order the suit to open itself so Krag's corrosive atmosphere could finish him off quickly? Or would he spend his last minutes like the trader must have, panting and gasping and rolling his eyes in terror as the nerve cells of his brain died one by one?

Damn this doctrine of collective responsi—

He sat up.

Seatten and Kellog still slept. He called the computer. "Listen. You said you were supposed to maintain this shrine in perpetuity, correct?"

"Yes, sir."

"Señor Schroeder strikes me as being a wise man. He must have anticipated that development would come to this area. He must have told you how to respond to civil authorities."

"Yes, sir."

"Did he tell you to obey all laws and ordinances, all rules and regulations?"

"Yes, sir."

"Well, there you go, then. You're violating local law by altering the pH balance of the water supply."

It said nothing.

Graczinski let a minute go by, and another, then waved a hand at it. "Well?"

"The executor program has already determined that substantial materials substitution lies outside its discretionary parameters, sir."

"I know that." He pointed to the swamp lapping at the edge of the plaza. "I'm suggesting that you install devices out there to cut the pH of the water to below 4.0."

"One moment, please." It turned misty around the edges for a moment. "The executor program has determined that the proposed environmental restoration program falls within its discretionary parameters. The project has, therefore, been approved, and will be complete within the week."

"Good. Make certain that the pH of the water downstream of you is identical to that of the water upstream of you."

"Yes, sir."

"Thank you." Now, would the

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Zreekull buy the idea? He hoped they would, but feared they wouldn't. And if they didn't, that left him exactly one card to play . . . ironically, a card they had given him. "Weiya!"

The Zreekull glided down from the clouds to land on his usual stump. "Yes, Gra?"

"They're going to fix the water. The worms will come back, and so will the fish and the grazers. Everything will be fine."

"That's good, Gra. But this shrine thing still has to go."

"You know, it's funny. I had a feeling you were going to say that." He unholstered his laser pistol. His heart beat faster. The air in his suit seemed to grow stuffy very quickly.

Weiya stared at the pistol. "If you shoot me, another will take my place. And then another after him. And so on, until your pistols have lost their charges and you can do us no more harm. And then, Gra, you will swing from the trees until more Terrans land to cut you down."

"Oh, I know that, Weiya. See, I'm going to shoot Seatten and Kellog. Once they're dead, their suits will shut down, and I can cut the fabric without it patching itself immediately. So I'll take them out of their suits, cut them into little pieces, and throw those pieces into your swamp. Then I'll kill myself."

"You're crazy!"

"Yes!" he said vehemently. "And do you know why I'm going to do this?"

"No."

"Because you've ordered me to do the impossible. I've solved your pollution problem, but you want more, and you won't give me the tools to do it. Therefore, our deaths will be your fault—and by extension, the fault of all your clan."

Turning his head so that one great brown eye focused on Graczinski, Weiya flexed his wings.

Graczinski grabbed his pack hose. "Give me a fine hard spray," he told his suit.

—Spray on.—

"Hey!" Weiya hopped straight back, off the stump. He flailed his wings for a moment, and Graczinski used that moment to wet him from head to tail. Weiya splashed into the swamp. "It'll take me an hour to get dry!"

"I didn't want you interfering, Weiya." He let go of the hose; it reeled back into his pack. "Now, as I was saying, since our deaths will be your fault, so will the pollution resulting from them. You and your clan will be responsible for removing from the swamp all the contaminants released by our bodies. Think about that, Weiya. Think about trying to track down every drop of our blood, every scrap of our flesh."

"Gra! Please, put the gun away."

"Will you give us back our ship and let us go?"

"I will." Weiya clambered back onto the stump. He held his wings horizontal to the ground, then brought them forward till their damp tips touched.

—Body language: On my honor as a flyer,—said the suit.

"Thank you." Graczinski bowed to the Zreekull.

"My people will not be happy about my letting this eyesore remain." He began to preen his feathers.

"I'm sorry about that, Weiya, but, uh . . . you know, you do have a state-

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of-the-art nanotech factory here, and I'll bet—" He broke off to address the holograph. "Can you design and manufacture some sort of long-lasting water repellent for Zreekull feathers?"

"Of course. But the executor program—"

Graczinski held up a hand. "Wait." He looked over his left shoulder. "Weiya, are your people familiar with the concept of 'rent'?"

Back aboard ship, three hours and three showers out from Krag, Destford Seatten focused his bloodshot eyes on Graczinski and smiled uncertainly. "I wasn't asleep, Cappie. I heard you threaten to kill us."

"Thanks for not screwing it up, then, Des."

A thoughtful look descended on Seatten's face. "You know, Cappie, our corpses wouldn't have polluted their swamp, anyway. The pH is way too low for terrestrial microbiota. The water wouldn't have spread our germs—it would have pickled them."

Graczinski laughed. The thought hadn't occurred to him at all.

And Kellog said, "Geez, Des, you think your germs would have even noticed?" ■

●A man lives not only his personal life as an individual, but also, consciously or unconsciously, the life of his epoch and his contemporaries.

Thomas Mann

●The meek shall inherit the Earth; but having inherited the Earth, shall they continue to be meek?

Abba Eban
Submitted by Ira Stoller

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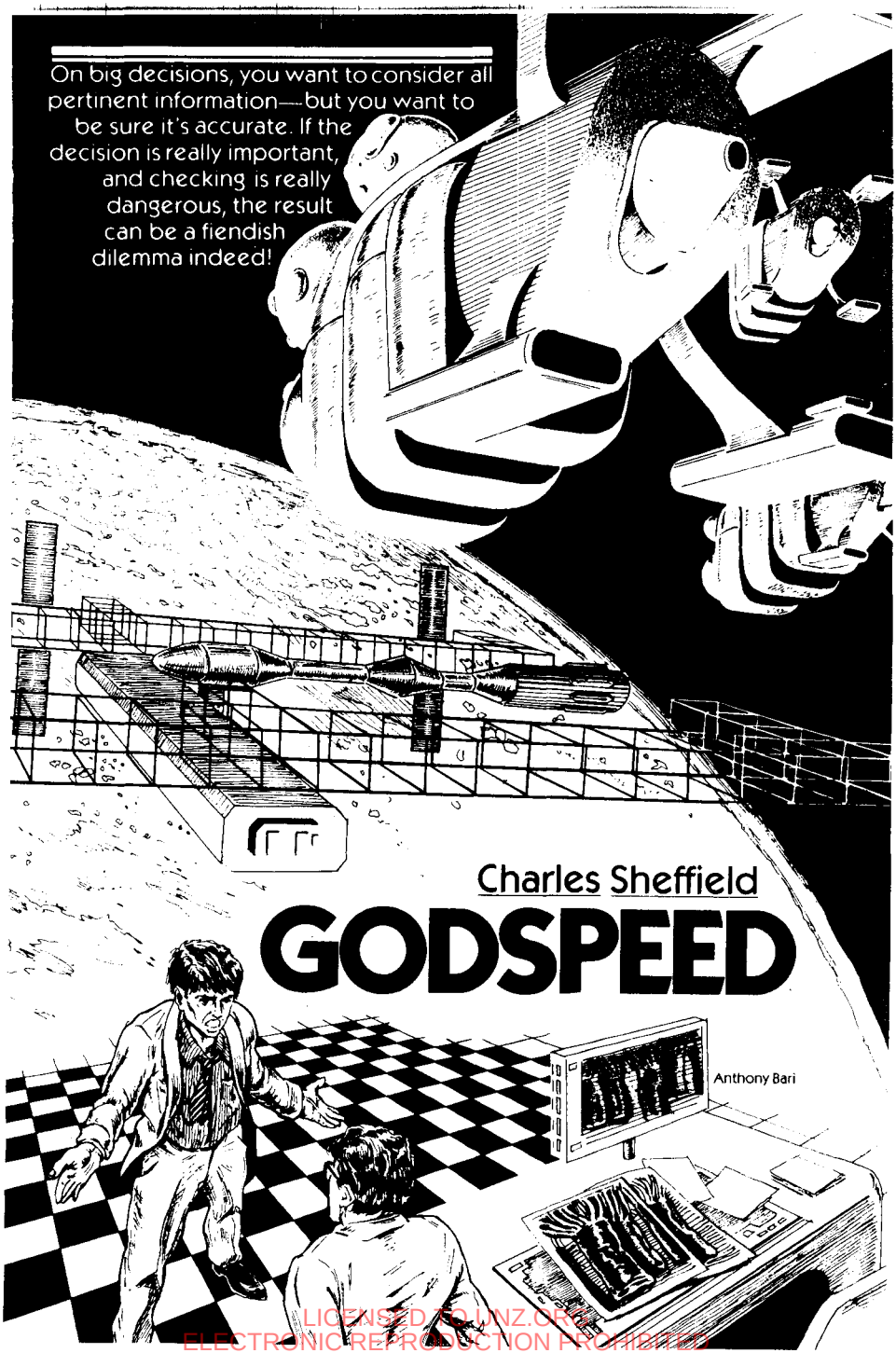
On big decisions, you want to consider all pertinent information—but you want to be sure it's accurate. If the decision is really important, and checking is really dangerous, the result can be a fiendish dilemma indeed!
Charles Sheffield
GODSPEED
Anthony Bari

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The Genizee came.

Two weeks later, the Genizee went.

The aliens are the most self-sacrificing and noble saviors of humanity that anyone could imagine; or else they are the sneakiest and most evil species in the galaxy, following a diabolical agenda that no human is able to fathom.

Which?

Marcus Aurelius Jackson, a millionaire, a madman, a genius, and my longtime partner in science and short-time partner in crime, says the Genizee are villains. Everyone else on Earth says that they are heroes. Me, I just don't know.

Not yet. But thanks to Marcus, I *will* know. Soon. In the worst case, it may be for just a fraction of a second, before the end.

It sounds crazy to say it, but although I think of myself as sane and rational while Marcus is a lunatic who may cause my death and the death of everyone on Earth, I'm as bad in some ways as he is—because I can hardly wait to learn the answer. That question —*Which?*—has been sitting in my mind for four months going on forever, like an internal and eternal itch that can't be scratched.

I sit here, waiting for the reappearance of the television cameras or the end of the world, and I want to *know*.

In my case it is more than a theoretical issue. I was in the middle of the problem long before the arrival of the Genizee—before their existence was even suspected. More than that, according to the aliens, I and Marcus Aurelius Jackson are the reason that they came to the Solar System—came just in time to kill the dream.

In my case, it *was* a dream. In Marcus's case, it was an obsession. I argue that there is an important difference between the two, though perhaps no one else would agree.

Let me go back to the period BG—Before Genizee.

Before the aliens popped out of nowhere, most people thought that the world's space programs were going well. The United States had the Farside lunar base close to self-supporting, with a 99 percent closed recycling of food, water, and supplies. Only the most complicated equipment was fabricated and shipped up from Earth. The Soviets had their permanent Mars colony at last, after 3 abortive tries and the loss of 147 people. The C-J consortium had a mixed Chinese and Japanese expedition wandering the asteroid belt, and another approaching the Jovian moons. ESA had their own explorer—unmanned, this one—heading out for a second Grand Tour with smart probes of the outer planet atmospheres.

This is truly the Golden Age of space exploration, said the media.

Big deal.

Don't be surprised when I tell you that although space funding paid my salary, not one of the developments that I mentioned occupied my working attention for more than one minute a week. Marcus and I fumed at the self-congratulatory speeches from the politicians of all countries, and wept when the "great accomplishments" in space were touted by the world's media.

Couldn't they see—couldn't *every-*

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one see, as we saw so clearly—that even when the Moon and all the planets were explored and colonized, we would still be playing in our own backyard?

If humans were *serious* about exploring space, the Solar System wouldn't do. We had to go to the stars, and we had to find a way to get there in a reasonable time. The fastest ship in existence, the Caltech/NASA Rocket Propulsion Lab's Continuous Electric Propulsion Planetary Probe (*Starseed* for short) was now heading for the inner edge of the Oort Cloud, but it would not arrive there for another ten years. That, measured in terms of my own life span, was surely not a *reasonable* time. And when it got there, three thousand astronomical units from the Sun, it would still be traveling at only one percent of lightspeed, and be only one hundredth of the way to the nearest star. Tau Ceti, our best bet for a close star with useful planets, would be a millennial journey for the RPL probe. Despite its name, the *Starseed* and its relatives were not and would never be the answer. They could not bring the stars within reach of humanity.

A faster-than-light drive: that was the way to go. The *only* way. Unfortunately, you couldn't even mention FTL to the Science Foundations who funded us. Marcus had tried it, and been ridiculed for his pains. Their committee of advisors was quite adamant. Nothing could go faster than light, the theory of relativity "proved" that, so not one cent should be wasted in trying. Instead we should spend the Foundation's money on something *useful*, like plodding ion drives or bone-jarring pulsed fission.

"Dummies!" said Marcus, when he got back to the lab. "Stupid jerks." He had said much the same thing to the committee, and it hadn't helped his case.

"I know," I commiserated. "They're a bunch of idiots. Curse 'em all."

I did a lot of cursing in those days, and without Marcus that would have been all that I could do. With him, though, I had as my partner a top-drawer physicist who had studied the absolute basics of quantum theory and relativity, instead of taking them as gospel. He had done so with one goal in mind: looking for the loopholes.

They were there, of course. Everyone from Einstein onwards had pointed out that the two fields were inconsistent with each other. And even within the framework of those inconsistencies, the structure of spacetime at a subnuclear level had to be a sea of singularities, continuously forming and dissolving. The very notion of "travel" through such a discontinuous medium in its constant flux was meaningless, said Marcus. It was the learned advisors to our funding sources, sitting in their smug certainty, who needed to go back and do "something useful."

I knew he was smarter than me, and anyone else I'd ever met. When he said that he saw a ray of hope, I believed him. His failure with the committee, and their ridicule, didn't shake my faith in him one bit.

"We have to keep trying," I said. "Show them they're wrong."

He shook his head gloomily, but soon he was working harder than ever. Rejection merely drove him to greater efforts. In the next few months he developed the theory further, and it

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looked good (to him, I mean—I admit that I couldn't follow it).

The next steps had to be mine, though. I was the fix-it member of the team, because Marcus was terrible at practical details, and the diverse techniques for lubrication of egos that these days are lumped together as "human relationships" were quite beyond him.

So I "fixed it." With, if I say it myself, my usual efficiency. (I sometimes think that the only thing in life that I find truly irresistible is the challenge to finagle something that everyone else says can't be done.)

Money wasn't the issue. Marcus had inherited bundles of that, and had found little use for it, but the equipment that we needed couldn't be bought. It was available only through government programs. So the prototype construction, and the first small-scale tests, had to be worked secretly using materials bootlegged from approved conventional projects. If that sounds easy, remember that all the construction had to be done *in space*. Without assistance from Inventory Control, who owed me quite a few favors, it could not have been done at all. Even then, it was not totally invisible. Someday an enthusiastic auditor would discover that the equipment orders and use did not match, and the game would be over. Long before that I expected to have gone to hell or Alpha Centauri.

It took five and a half years from the day of Marcus's key theoretical insight to the first space test. On that day the two of us, crowded into a small cargo capsule never intended for anything but free-fall storage, paused and looked at the little payload, then at each other.

"Well?" he said.

I nodded. He drew a long breath, shrugged, and toggled the switch.

The payload vanished without a sound.

The test transition—Marcus insisted that it shouldn't be called a test *flight*, since the payload would not be "traveling" through normal space—had been designed to carry an array of sensors eighty million kilometers to the vicinity of Mars, take a handful of pictures there, and return to the cargo capsule. It was supposed to be gone for just twenty minutes, almost all of it spent out near Mars.

Twenty minutes? I have known shorter months.

When the tiny payload popped back into existence, we both gasped. And when we examined the data it had collected, I at least got a lot more than I had bargained for.

The payload had not made the journey to Mars in a single hop. Instead, Marcus had programmed it to drop back periodically into normal space, make an instant navigation fix, and use that to direct the next transition. The resulting set of images was mind-blowing. The fixes had been taken every hundredth of a second, two hundred thousand kilometers apart. Seen in real time, they provided the series of frames that would have been obtained by a ship traveling at twenty million kilometers a second —nearly seventy times the speed of light. God speed.

I watched those movies about a hundred times in the next twenty-four hours, drunk with euphoria and the conviction that Marcus and I would ourselves be remembered as gods. We were the New Prometheans, the men who

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gave humanity the Universe. (Like most people who play with fire, I had forgotten what happened to Prometheus). I wanted to go public with our results, right away. As I told Marcus, we had more than enough evidence to justify funding for a complete series of operational tests.

At that point, he dug in and couldn't be budged. The establishment hadn't just said a polite "No thanks" to his theory, or pleaded poverty to explore it. They had *mocked* his ideas, suggesting that he was a crank or worse. Now he wanted to make a *manned* flight, go out in person farther than anything had ever been, and take hand-held pictures. Then he would come home, go to the skeptics who had told him he was a charlatan, show them our results, and invite them to stick it in their ear. Before that, he wanted complete secrecy.

Fame and fortune weren't enough, you see. He wanted *revenge*.

I should have refused to go along with him, but he always burned a lot brighter than me. We argued for hours, until at last I gave in. He told me what he wanted for the Big Test: out a thousand astronomical units, so Marcus could get a shot of the *Starseed*, against a backdrop of the shrunken Sun and scarcely visible planets.

If finding the resources for the small test had been difficult, the new one —manned ship, life-support, full navigation and control systems—had me tearing out what was left of my hair. To be honest I also had a wonderful time, juggling three dozen people and organizations at once, but it was still another six months before I could go into his office and say, "Well, you asked for it, Marcus, and you got it. We're in business. All-up manned test for Project *Godspeed* is set for one week today."

"You actually got the flight permits, Wilmer?"—that's me—"How'd you fix it? I'd have bet it was impossible."

This had been one of our main worries. Stealing equipment had become fairly routine, and we had even managed to divert attention from our true activities by describing the *Godspeed* itself during the ship's construction as a "pulsed fission-fusion pre-experimental post-design model," which was enough to put off anyone. The earlier test had been on a scale small enough to hide. But the new one could not be concealed, since although the FTL transition should produce no detectable signal, according to Marcus the macroscopic quantum events leading up to it would make the *Godspeed*'s whole exterior sparkle and glitter like a cut gemstone catching the noonday sun.

"It *was* impossible," I said. "I had to use all my chips on this one. I wouldn't be surprised if we get caught."

"Who cares?" he said. "When we get back from this trip—"

And at that precise moment, when the day of glory was within reach, Sally Brown from Ground Operations came running into my office without knocking, switched on the little TV set that perched on the corner of my desk, and said breathlessly: "Messages and pictures. Coming in from space. All over the world, hundreds of different wavelengths. Not from Earth. From the stars."

I don't know what Sally Brown's

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words did to Marcus, but they created in me such a conflict of emotions that I wanted to throw up. On the one hand, the arrival of aliens and their superior technology would make all our work for the past few years as obsolete as the horse and carriage; on the other hand, I would have what I had wanted for so long: access to the stars.

We froze in front of the TV screen, waiting for our first look at the Genizee.

What we got instead was a look at their ships, inside and out, and at their technical equipment. No pictures of aliens, not then. We learned later that they weren't sure Earth people were ready for three-foot-long cylinders of quaking black jelly, topped by a writhing mass of yellow spaghetti. Instead, we got pictures of technology.

Oddly enough, it was the sight of the ships that Marcus and I, alone of all the people on Earth, found hardest to take. The video signals had been beamed to Earth a few hours earlier, from just beyond the orbit of Saturn, along with a series of radio messages—in seven major Earth languages—proclaiming peaceful intentions and giving a projected arrival time at Earth equatorial orbit in less than a week. The radio messages we could take. But the ships . . .

Marcus caught on first. "Where is it?" he said, almost under his breath. "Wilmer, *where's the drive?*"

No one else would have been able to understand his question. But I did.

The form of certain technologies are dictated completely by the laws of chemistry and physics. That includes all propulsion technology. For instance, a rocket is a rocket, no matter whether the propellant is hot neutral gas, ionized particles, or radiation; and it makes little difference if the energy comes from chemical or nuclear processes. Similarly, a laser is a laser, regardless of wavelength or energy level. And the FTL drive that Marcus had conceived, and that we had both been working on so hard, had its own characteristic physics and signature.

The Genizee ships showed no sign of that signature. Either they had traveled across the interstellar void using a method which was so advanced that we could not recognize it; or—far more likely, in Marcus's paranoid view—they were deliberately withholding all information on their FTL drive.

Neither Marcus nor I could imagine a third possibility.

When the third option was proposed, Marcus did not believe it. He has never believed it, to this day.

In retrospect, the aliens broke it to us slowly and carefully.

First, they brought their three ships into orbit around the Earth, five hundred miles up, and sat there quietly for a week and a half, doing nothing except chatting over the radio and making sure that their mastery of Earth languages was complete. They told us a lot about themselves during that period, and asked for nothing in return but our idiomatic phrases. On the first day we learned that they came from the Tau Ceti system. (Marcus and I had been right on target, though we received little satisfaction from the thought.) Day Two they gave us a description of their civilization, with its five populated planets and moons and its links to other, more dis-

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tant intelligences; all, according to the Genizee, were as peaceful, well-meaning and sympathetic as they were.

The fifth day brought a first look at the Genizee themselves. By that time they had soothed us so well that most people's reaction when they saw a picture of a Genizee was *sympathy* that any rational being had to live with being so ugly.

The sympathy faded a little when the Genizee told us that they lived, on average, for twenty-seven thousand Earth years. When asked if they would make the longevity formula available to humans, they replied, with an apologetic quiver, that there was no formula. The Genizee had always been so long-lived. Almost everyone except Marcus believed them. He was already full of dark surmise.

The bombshell dropped by the Genizee near the end of the second and final week confirmed his suspicions. Asked during a TV broadcast (the world had lived glued to TV sets since the arrival) about their journey to the Solar System, they offered an implausible reply. They had not used an FTL drive at all, they said, but an efficient sub-light-speed drive that allowed them to reach over half the speed of light. They had been on the way from Tau Ceti for twenty-five years. All their journeys between the stars were made at a fraction of light-speed.

The blue-ribbon panel of elderly scientists who had been assembled to interact with the aliens were, if you can believe it, *pleased* by that reply. It confirmed, they said, their own conviction that faster-than-light travel was a physical impossibility. Nothing could ever move from one point to another, faster than light would cover the distance.

Well, said the Genizee, quaking apologetically, that's not exactly the case. In fact, the reason why we embarked on this long journey to Earth in person, rather than sending messages that you might not believe, or might think to ignore, was just this: Certain of your scientists have been conducting FTL experiments. . . .

No one had looked to Marcus Aurelius Jackson or me for help and advice when the Genizee arrived. Why should they? We were young and junior, without reputation or known accomplishments, and Marcus had already been branded as a crank. Even if we had offered our services, no one would have taken them, or listened to what we might have to say.

That changed in ten minutes—the ten minutes when the Genizee explained that faster-than-light travel was not impossible; that it offered enormous danger and possible total destruction to any species that attempted it, for reasons that they would be happy to explain to us; that such attempts were being conducted on Earth at this very moment; and that the Genizee had come here with two main goals: to pinpoint the location of those experiments, and to warn the inhabitants of Earth, telling them to cease and desist.

My own immediate reaction was total disbelief, with good reason. If the Genizee had been on the way for twenty-five years, they must have left twenty years *before* we had even the theory for an FTL drive. So they couldn't have started out for Sol just because they'd

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picked up evidence of what Marcus and I were doing.

It was Marcus himself, no fan of the Genizee, who quickly put me straight on that one. He had long known that any FTL drive would give rise to both *advanced* and *retarded* potentials, similar to those of conventional electromagnetic theory. Both potentials propagated through spacetime, and died out in magnitude—but the advanced potential moved *backwards* in time. The experiments that we had thought to be so secret might be detectable by the Genizee, before we had performed them.

They confirmed his comment later in the same broadcast. They could detect the signal from afar, they said, even as far away as Tau Ceti. But only when they came very close to Earth could their equipment pinpoint an exact *location*. They had done that now. They would be happy to provide that location to Earth authorities.

They did so, and added a few more minutes of stern warning on FTL drives. Half a dozen uses, they said, were often enough to cause "major repercussions" in the region of space.

Having said that, to everyone's amazement they started their ship drives and headed away from Earth.

It was bad for an emerging civilization, explained their departing message as the three ships lumbered off towards Saturn, to suffer major exposure to an older and more advanced one. Now that their warning had been delivered, the only responsible thing for them to do was to leave, and let us humans make our own way. Goodbye and good luck, people of Earth.

I gather that our scientists and politicians went into shock—they had been hoping for free technology from the Genizee, and had received nothing but talk. Marcus and I didn't take much notice at the time, because we had our own worries. Within hours of the last Genizee broadcast, our lab had been closed and was guarded by enough military men to fight a major war. Marcus and I were arrested. We were charged with theft of government equipment, misuse of grant funds, and travel without suitable permits.

Those crimes should not have been enough to hold us in confinement. They were. After what the Genizee had said, no one was willing to let us go free, not because of what they thought we *would* do, but because of what the aliens told them we *could* do.

Relax, said Marcus and I to each other. We can't really be kept in jail like this for more than a day. Can we?

What innocents! We sure could. For the first time in my life, I learned what was meant by a witch hunt. I doubt if one person in a million understood the explanation that the Genizee had offered of the dangers of a faster-than-light drive, but they didn't care. The Genizee themselves had fingered us, so we were guilty. We'd be kept under close guard, without a trial, unless the Genizee returned and said we were to be released.

I myself didn't understand what the Genizee warning was all about when I heard it, but my cell-mate was Marcus Aurelius Jackson. *He* knew what they were telling the whole world—and he didn't believe a word of it.

Marcus didn't just explain his views to me. He told the guards, our family

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members, and finally, after two months of work from me, the three members of the press who could be persuaded to come out to our maximum-security prison in the Nevada desert to interview us.

"A faster-than-light drive needs a tremendous amount of energy," he said to the three reporters. We were all sitting in one room, without bars between us, because I had been working hard on our guards, and finally had them to the point where they thought we might be crazy but we were surely harmless. The room even had a tiny barred window, with only four guards posted inside, and another two just beyond the door.

"A huge amount of energy," Marcus went on. "The only practical—or even theoretical—way to get that much energy is from the vacuum itself. You have to tap into it."

"You mean, you get energy from nothing?" said the most junior of the press. He had an open, gullible face. The other two, one man and one woman, didn't look even vaguely interested, and I guessed that they thought of the whole trip as a chore they hadn't been able to wriggle out of.

"Not from *nothing*. From the vacuum!" That was one of Marcus's problems, because although it was clear from their facial expressions that this subtle distinction was far beyond all the reporters, he swept right on: "Now, the energy available from the vacuum is so big, you tend to think of it as unlimited. But the Genizee insist that tapping the zero point energy sets up a local stress in space, which ultimately must be relieved. If you remove local energy past a certain critical point, they say, there will be a jump to a lower-energy ground state. The only more stable state is a black hole. The whole region pinches off from the rest of the Universe."

"In other words," I said. "The rest of the Universe will get rid of the stressed region by making it *vanish*." I saw the open mouths, and wondered if I was being as obscure as Marcus. But he had been over this with me again and again, until I had something that made sense to me inside my head. My picture might be over-simple, but the reporters ought to find it easier going.

"Imagine that there are a whole lot of elastic bands," I went on, "all over the Universe. Somebody starts to stretch one, in one place. That's what we were doing, when we tested the drive. You can stretch it a fair bit, and nothing happens. All the other bands give a tiny bit, and everything settles down again. But if you go on stretching, there finally comes a point where something has to give. The band breaks. When it does, everything *can't* go back the way it was. You've got snapped elastic, and you're catapulted right out of this Universe."

"And that's what the Genizee are warning us about?" said the young reporter.

"They were. But it's *not true*," said Marcus hotly. "When I heard what they were saying, I went back and did all the calculations over from scratch. There's no backlash effect. Spacetime makes a small and quiet adjustment—maybe the local curvature decreases by one part in ten to the twentieth. An FTL drive is quite safe."

"But that means the Genizee were *lying* to us," said the woman reporter, in an annoyed tone. "Are you suggest-

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ing that they *didn't* come all this way on those ships? Or that they *didn't* take a quarter of a century to get here?"

"Both!" said Marcus loudly. The guards stirred, and made sure their weapons were at hand. "They were lying about *both*. They didn't come all the way in those ships, and they didn't take a quarter of a century to get here. They came from Tau Ceti—if that's really their home, and they're not lying about that, too—in a big, fast ship, with a faster-than-light drive. They parked the mother ship out beyond Saturn, where we couldn't see it. Then they switched to their slow little ships, and came crawling in the rest of the way to Earth."

Marcus was losing any shred of credibility he might have had, because the youngest of the reporters at once asked the obvious question: "But *why* would they lie to us? What good would it do them?"

"They don't want us to use the FTL drive. They want to bottle us up, here in the Solar System. They don't *want* humans out among the stars. I think they're *scared* of us, because we're smarter than they are."

It sounded paranoid, even to me. He was wasting his breath anyway. Even if the reporters believed him, and it was clear to me that they didn't, they would never find an editor willing to run the story. The Genizee, initially repulsive in appearance, had not stayed long enough for humans to learn their possible defects. Their slow and bumbling speech patterns and apparent confusion, which Marcus considered evidence of human superiority of thought, were to most people part of their appeal. The Genizee had become everyone's favorite alien, and you couldn't get away with a bad word about them. The stores were packed with cute little mop-topped black jelly cylinders—although for aesthetic reasons the toys didn't have the disgusting layer of slime that allowed the amphibian Genizee to function out of water.

When it was Marcus Aurelius Jackson against the Genizee, M.A.J. didn't have a chance. After all, hadn't the altruistic Genizee taken many years of their own lives, just to come to Earth and deliver a warning? And weren't they, even now, creeping back across the light-years in their cramped, uncomfortable little ships, with twenty-five years still to go? How many Earth people would do something like that, even to save their own closest relatives? *Especially* to save their closest relatives.

So, although Marcus went on talking, I knew he was wasting his time. He wouldn't get one inch of column space or a second of air time for his unpopular views.

As it turned out, I was wrong. "MAD DOG SCIENTISTS UNREPENTANT!" shouted the only headline. And underneath: "Death Penalty Favored For Insane Inventors."

Marcus is an interesting case for the psychologists. When his idea of a faster-than-light drive was ridiculed, he redoubled his efforts. And when his just-as-heretical views of the Genizee were pooh-poohed, he at once turned all his efforts from conjecture to possible methods of proof.

"There has to be a way to show that

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I'm right," he said. "Wilmer, let me try something out on you."

I said nothing. When you are living together in one locked room, it is hard to avoid a discussion.

"Point one," went on Marcus. "According to me, the advanced potential from our test must damp out rapidly as it goes backwards in time. The Genizee say they picked it up a quarter of a century ago, but I say it fades to background level and becomes undetectable in a year or less. If I'm right—and I am—they can't have picked up evidence of our test more than a year before they got here.

"Point two. They say they came from Tau Ceti, and their departure trajectory supports that idea. Even if they didn't, though, they certainly came from outside the Solar System. The nearest star is over four light-years away. Four light-years, or more, in one year or less means they *had* to have come using a faster-than-light ship.

"Point three. They left two weeks ago. If they really intend to fly all the way back to Tau Ceti, or any other interstellar destination, in those sub-light ships, they are still in the early acceleration phase of the trip. Even with the most efficient propulsion system I can imagine, it will take them nearly a year to work their way up to half the speed of light."

He stared at me. "Do you see what that means?"

"It means they're still a hell of a long way from home. They're as altruistic as everyone believes."

"*No.*" If the press could have seen Marcus now, they would have felt that their MAD DOG SCIENTISTS UNREPENTANT headline was thoroughly justified. "Wilmer, it means that if they were telling the truth about how they came here, and how they are going back, and where they are going back to, then *anyone with an FTL ship could fly out and catch up with them.* If they aren't where they should be, then they are lying, either about coming from Tau Ceti or about the drive. One lie is enough to discredit everything they said to us. If you ask me, they're already back home, wherever they came from—and I'll bet money it's not Tau Ceti—having a good laugh at the credulous people of Earth."

I looked at him, then let my eyes roam around the featureless beige walls of the room. "Let *me* try something out on *you*, Marcus. Point one. There is just one FTL drive in the Solar System, and it is impounded, up in orbit and protected by maximum security guards, because everyone on or off Earth is terrified of it. If they weren't afraid to touch the thing, they'd have destroyed it long ago.

"Point two. There are just two human beings who know how to fly that ship. No one else will go near the *Godspeed*.

"Point three. Those two humans are locked away in an underground room in a building in the middle of the Nevada desert. They have no tools, no friends, no money, and no way of getting to space, still less of reaching the *Godspeed*. Forget it, Marcus, you could never do it, not in a thousand years."

"I know I couldn't," he said. He was still staring at me. I felt a quivery feeling in my stomach, as though my recent breakfast had suddenly been converted to live worms.

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"I know I couldn't," he said again. "That's not my line. But you, Wilmer, if you—"

"It's impossible."

"I'm sure it is."

"*Totally* impossible."

"Yeah." He stood up and went over to lie on his bed without another word.

After a few seconds I went across to my own bed, lay down on it, and closed my eyes. I decided that I hadn't been totally honest when I was speaking to Marcus. I still had friends outside, and I still had some equity with them for past favors. I had cultivated our guards, too, drawing a little on Marcus's wealth, to the point where they normally left us to ourselves, but would do the odd paid favor for me provided it was obviously no threat to them or to anyone else. So far as the security around the *Godspeed* was concerned, I had probably exaggerated that. No one would be too worried, as long as it was known that Marcus and I were locked up here. . . .

I shivered, and stopped my thinking right there. What was Marcus trying to make me do? Help him to destroy the pair of us, and the whole of the human race as well? But he had touched that dark, hidden spot where the true ego dwells. Now the live worms in my stomach had crawled up my throat into my brain, and set it on fire.

If we escaped from prison, the alarm would go off at once. The search for us would begin. The two of us would never make it far outside the prison walls, let alone into space, and the guards around the *Godspeed* itself would be tripled in numbers and placed on maximum alert.

But it took only one person to fly the *Godspeed*. And there would be real juggling to be done here, inside the prison, to hide the fact that one person's escaped.

Marcus, then, to pilot the ship and to design the programs that would allow the sort of freeze-frame sequence of hops that the unmanned payload had taken to Mars, searching at each transition for the Genizee ships. I, to stay here and to arrange matters—how, for God's sake? I had no idea—so that no one knew that Marcus was missing, until he was on his way in the *Godspeed*.

I opened my eyes. Marcus was sitting up on his bed, gazing at me expectantly.

"Any good?" he asked.

"Go to hell." I closed my eyes again. What did he take me for? I had been lying there for maybe three minutes. Extraordinary things can sometimes be done in real time. Miracles take a little longer.

A "little longer" in this case turned out to be six weeks. Everything had to be choreographed tighter than a five-ship orbital rendezvous. I broke the problem down into discrete pieces, each one requiring a solution if the whole effort were to succeed. Marcus had to escape from here unnoticed. Then I had to conceal the evidence of his disappearance for at least five days. Marcus would need that much time to travel from Nevada, all the way out to the *Godspeed*. Then he had to have credentials that would allow him to board the ship, and he had to remain there undisturbed. After that he would be on his own.

I was prepared for a year-long effort, with a good chance of failure at the end of it. It is a curious fact that my six-week success was possible only because

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I had been placed in prison. Given enough money, and Marcus had plenty of that, a man can get anything in jail that he can get outside it—plus a whole lot more. Prisons, as I quickly learned, are the natural focal points for any imaginable legal or illegal activity.

You want Marcus Aurelius Jackson to take part in the sensory deprivation experiments now being conducted in this very jail? The external university team responsible for the experiments will be glad to have him. To them, one healthy prisoner is much like another, and the recommendation of the guards is all that they ask. Bringing someone *into* a prison, to enter the sensory deprivation tank in place of Marcus, costs a few thousand dollars. Getting Marcus out in that man's clothes is more expensive, but not much harder.

Not everything is so cheap. You would like a set of forged credentials, showing that you are a Nevada businessman making a trip up to space with a need for commercial secrecy? No problem, except money and lots of it. Many of the world's best forgers are already behind bars, ready to serve you.

The one piece of the puzzle that I couldn't see how to solve would be on board the *Godspeed* itself. Marcus didn't want company on his journey, so somehow he had to arrange to be left *alone* on the ship, long enough to make the first FTL transition.

While I was still pondering that, Marcus was worrying a different issue.

"I hope the ship's power plant has been left on," he said, as we were transferring some of his money to an anonymous bank account. "It would be a pain to have to bring all the systems back online."

I stared at him. "Thanks, Marcus. That's what I needed."

His new forged credentials showed that he was a specialist in industrial safety, flying out to the *Godspeed* to power-down the ship's dangerous nuclear equipment so that it would not explode. With that in hand, and a few casual words as he went aboard, it would be difficult to get anyone else to stay within a thousand kilometers.

On the final morning we shook hands, for the first time in our long acquaintance. The door was unlocked from the outside. Marcus left the room, and a man in his twenties wearing a bewildered look and a bad case of acne appeared in his place. Within the hour he had been collected. I wondered briefly if he even knew what sensory deprivation experiments were. From the look of him, it would be little change from his existing condition.

I settled down, to estimate Marcus's progress. Now he would be approaching the airport, dropping off the rented car that had been arranged for him outside the prison and collecting his ticket. Now he should be at the space facility, undergoing a routine physical check that included a DNA identification. He ought to pass that easily—I had rented the best illegal hacker that money could buy, to slot an ID for Marcus into the right computer data bank. Eight hours later he should be ascending to orbit, and four hours after that he would be in an orbital transfer vehicle, on his way to the *Godspeed*.

I kept the TV on, twenty-four hours a day. No news was good news, of

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course, until Marcus reached the *Godspeed* and could take the final step.

I had plenty of time to wonder if my faith in Marcus was too great. It was one man against the world, his authority against the word of the Genizee.

This morning, right on schedule, the television came alive. Every channel reported the inexplicable disappearance of the *Godspeed*. It was obvious that they had no idea what was happening, since the commentators were worried about the fate of the "safety inspector" who had been on board at the time. Within the hour, I was being questioned.

I saw myself on television, and learned to my relief that Marcus Aurelius Jackson was "in prison, but unavailable for comment." I said that I could tell them nothing useful. I thought that I looked worried.

I was worried. And now, late in the afternoon, waiting for another television interview, I look at my guards and at the afternoon sun streaming in through the bars of the little window, and I am still worried.

Although Marcus and the *Godspeed* left only ten hours ago, they ought to have been back long since. Following the path supposedly set by the Genizee would have taken our ship only a few seconds, even with the brief pauses between transitions needed to drop back into normal space and scan for the Genizee ships. Marcus could have traveled out half a light-year, well past the place they ought to have reached with their slow ships, and still have been back hours ago.

Strange thoughts have been running through my head. Suppose that Marcus found the Genizee ships, and they destroyed him so that he could not return and tell? We had never asked if their ships carried weapons. Then I realize that my thought is totally illogical. Marcus could find the Genizee only if they had told us the truth, and were lumbering along in their slow ships. In that case, they would have nothing to hide from us.

But perhaps Marcus, having failed to find any trace of the Genizee on the way to Tau Ceti, had decided that they were concealing from us their true place of origin. It would be easy for him to take the *Godspeed* out for a second journey, toward some other probable stellar target. And if that produced no result, he might go out again. How many trips might he make, before he had enough evidence to prove to anyone back on Earth that the Genizee had been lying?

I know Marcus very well. It is part of his nature that he likes to be absolutely sure of things. He will not risk being mocked again. I would settle for one trip out, and rest my case. He might feel he had to make a dozen.

And that leads to another thought entirely. Half a dozen full-scale shots of the FTL drive, according to the Genizee, could lead to "major repercussions" in a region of space.

How big a region? The Genizee were talking of the collapse to a black hole that was part of spacetime, with the separation of that region from the rest of the Universe. Are we dealing with the collapse of something the size of a ship . . . or a planet . . . or a Solar System? Would the collapse take place violently, or quietly and unobtrusively?

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And would the *Godspeed* itself be inside that region, or excluded from it? Might Marcus and his ship, left outside, become the only evidence in the whole Universe that humans had ever existed?

Those are the sort of questions I am not equipped to answer. I wish that Marcus were here, to assure me that the Genizee were certainly lying, that I am talking nonsense, that I have nothing to worry about. I take some comfort from the setting sun, shining as usual through the little barred window.

But I wish that dusk would come quickly. I want to look for the stars. ■

IN TIMES TO COME

● Todd Cameron Hamilton has our cover next month, with a scene from Paul Ash's novelette "The Hornless Ones." The folk of the title play an important role in the story, but they're not its primary subjects. That position is reserved for one of the ingeniously conceived alien races Paul Ash is known for, though these are alien (and quite thoroughly so) in some senses only. Consider the fact that *Homo sapiens* is currently in the early stages of learning to do quite unprecedented things by way of adapting Earthly lifeforms (including his own) to other worlds. Those abilities, however highly developed, may not always be applied as conscientiously as they might. But then, by the very nature of the processes involved, the victims of such slips may be able to do more than you'd think to help themselves. . . .

Dr. Robert L. Forward will be back with another of his provocative scientific speculations: "The Negative Matter Space Drive." Don't know what negative matter is? Read the article! Actually, we're not even sure it exists—but we don't know any reason why it *can't*, and there's an informal axiom in physics that anything that *can* happen, does. There are even some observational hints that negative matter *does* exist—and if it does, it has some mighty peculiar (and potentially very useful) properties!

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The Alternate View

TELEPRESENCE—REACH OUT AND GRAB SOMEONE

John G. Cramer

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Does science fiction *really* anticipate the future? Does it point unerringly in the directions that technology is likely to take us? Or does it fall victim to simplistic analogies that mistake the difficult for the easy, the unlikely for the likely? Consider the robot: humanoid robots have been stock figures in science fiction from Karel Capek's *R.U.R.* through Jack Williamson's *Humanoids*, and Isaac Asimov's famous robot series that has proceeded from the *I, Robot* stories to the robot novels, and the Good Doctor's recent "sharecropper" robot anthologies.

Superficially, the robots of early SF appear to be a prediction that is on target. In factories all over the world "robots" are replacing human workers at production lines that assemble everything from Toyotas to Macintoshes. Surely it's only a matter of time before these robots walk out of the factories and into shops and business offices, replacing human workers everywhere with more efficient mechanical substitutes. Indeed, many SF writers have based stories on just such premises.

Well, you needn't feel threatened. It isn't going to happen, at least not anytime soon. To understand why such a robot takeover isn't likely, one has only to take a good hard look at these manufacturing "robots." They are *not* general purpose metal humanoids that clank and scurry around the factory floor, putting devices together, perhaps constructing more of their own kind. They are huge special-purpose machines that can function only when provided with a regular schedule of maintenance and recalibration. The robot programming bears little resemblance to Asimov's "robopsychology." It is a very simple and specific set of instructions, and is often generated by tracking a human expert as he performs the operations that the production robot will then mindlessly follow.

Further, these production robots are not mobile; they are bolted firmly to the floor, and for good reasons. Any small shift in their locating baseplates, any wear in their actuator mechanisms, destroys their effectiveness until such time as they can be recalibrated and realigned by human beings. The real robots of the late 20th century have little in common with Asimov's humanoid robots. Why not?

As we learn more about the engineering field of robotics, as researchers try to construct machines that can duplicate the dexterity of humans in manipulating objects, an important message emerges: *It ain't so easy*. As our technology reaches the plateau where it should be easy to duplicate human dexterity, the Asimovian goal of the humanoid robot has receded behind nested walls of problems that appear faster than can be solved: *How can the robot recognize the target object when it may be at any arbitrary position and orientation? How can the robot determine the*

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spatial location of its own manipulators? How can the robot predict all the effects of a given mechanical action? And so on . . .

It seems so obvious to us that it's *easy* to run and catch a baseball or to select a needed tool from a drawer, while it's *difficult* to add up a long column of figures or to memorize the script of a play. Yet for digital-computer-based machines the latter actions are trivial, while the former are such daunting problems that they have not yet been solved by our top robotics experts.

Human dexterity emerges not as an easily duplicated mechanical action but rather as a dimly understood miracle, the gift of a billion years of evolution. We are so good at manipulating objects because in order to survive, we have needed to be. For our survival, nature has provided us with an elaborate system of neural programming. It is this that allows us to easily reach out and pick up an object from a desk, to swat a fly, to pour a glass of water, actions that our best robot manipulators backed by our best supercomputers and computer vision systems can only poorly duplicate. Our technology is simply not yet ready to provide us with the mobile humanoid robots predicted by SF and seems very far from doing so.

Or consider another familiar SF prediction: *the neural interface*, the capability of linking human mind to computer, of "jacking into the Net" as described in Vernor Vinge's "True Names" or William Gibson's *Neuromancer*. The analogy of nerves to wires, of the learned patterns and memories of the human nervous system to the programs and stored information of digital computers, has led these writers to the expectation that some direct interface between brain and computer should be achievable in the near future.

While a two-way neural interface is not impossible, from the perspective of present day technology even a brain-to-machine neural link for general use looks remote. This conclusion is based on attempts of medical technology to control prosthetic limbs by detecting nerve impulse, e.g., controlling an artificial hand from the nerve endings in the stump. This has actually succeeded to a limited degree, but requires enormous effort to establish even the simplest neural "connections." These connections differ enormously from one individual to another, so that each case is unique. It appears that there is no single "data bus language" intrinsic to the human nervous system that would allow the straightforward installation of some general purpose one- or two-way interface to a computer. This conjecture is supported by PET scans of human brain activity during a variety of mental activities. These indicate that the basic organization of the brain can vary dramatically between individuals. It appears unlikely, for example, that an improved technology for detecting and inducing brain waves could soon lead to a good brain-to-machine link.

But let's not abandon all hope. There's more than one kind of machine-human interface. And one line of development close on the technological horizon promises a kind of brain-computer link and a kind of mobile humanoid robot. It's called *telepresence*, the linking of human to machine electronically using

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Illustration © 1990 by William R. Warren, Jr.

only the available senses (sight, sound, and possibly touch), but done so well as to give the illusion of true physical presence on one or both ends of the link.

Let's start with a simple example of telepresence. In his book *The Tomorrow Makers*, Grant Fjermedal describes a visit to a telepresence research laboratory located in Tsukuba, Japan. There the researchers lowered a black-velvet lined box over Fjermedal's head and strapped it in place. Within the box were earphones and two small color video screens, each optically matched to one eye. Grant's head was free to move within the box, but every movement of his head was measured electronically. Wires from the box led across the room to a robot-like machine with an articulated "head" on which were mounted twin television cameras, their lenses separated like human eyes. The robot head was also fitted with microphone "ears," and the whole head assembly moved to replicate any movement of Grant's head, as monitored by the box across the room

Fjermedal's experience was not of

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having his head in a dark box, or of watching video screens. The depth and scope of human vision was so completely reproduced, the colors so clear and vivid, that his first reaction was the disorientation of not being where he had expected to be. His second reaction was one of wild visual delight. Wherever he turned his head, the images received by the video cameras and transmitted to his retinas faithfully reproduced what he would have seen directly. He studied the computer panels, the work tables, the instruments that filled the laboratory. Then, with the help of one of the researchers, he turned and looked across the room. Over there he could see a familiar figure, his head strapped in a black-velvet box. It was Grant himself. The researchers laughed. They knew well the epistomological paradox Grant had just encountered. They had all gone through it themselves during their own electronically induced out-of-body experiences. "Are you here," the group leader asked him, "or are you there? Which is your body?" Telepresence may soon confront us all with this paradox.

The link between Grant and the telepresence head spanned only a few yards, but it could just as well have been the width of a continent or an ocean. As the world is criss-crossed and knitted together by fiber-optics communications links, the price of communications bandwidth is one of the few commodities that is falling faster than the cost of microelectronics itself. In the near future it will be feasible to link, at low cost, some improved version of the Tsukuba prototype "black box" to a remote telepresence unit anywhere in the world. The remote units can be given mobility, better sensors, faster response. The user's headset is already being reengineered to reduce it from a large box to a helmet or even a pair of "magic glasses." The addition of eye-position and eye-focus monitoring to the headset are currently bring investigated as ways of improving performance.

Imagine now that you are a user of some advanced telepresence system. You could, without leaving home, climb a peak in the Himalayas, explore the Amazon rain forest, or investigate the bizarre life forms near a volcanic vent on the bottom of the Pacific. Business people could bypass much of the expense and effort tied up in travel by using telepresence for conferences and meetings. The "location" visited by the telepresence user need not even be real. It might be a computer-generated "virtual reality." But we will save discussion of virtual reality for another column, and focus here on interactions with the real world.

Must the telepresence user be only a passive observer? Let's recall another famous SF prediction: Robert Heinlein's "waldo," a remote robotic hand electronically operated by a human. As SF writers sometimes do, Heinlein oversimplified the technical problems of the waldo. Up-scaling and down-scaling remote manipulators is a far more difficult undertaking than he imagined, because the time constants and material strength parameters change at each size scale. Nevertheless, the whole area of remote manipulation from hot-cell chemistry and machining with radioactive materials to underwater remote

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handling owes Heinlein a deep debt.

The waldo concept grows considerably more powerful when combined with high-quality visual and auditory telepresence and with new manual interface devices like the "data glove," which senses hand position and movement. Reproducing human dexterity and pattern-recognition skills, a presently intractable problem for true robotics, is easy with telepresence because the neural programming of the operator effortlessly supplies these functions. A computer between the operator and his waldo manipulators can further enhance the illusion of presence and direct manipulation by supplying the visual, auditory, and tactile cues that the human operator expects, including force-feedback that restricts the motion of the glove when a solid object is encountered.

Response time, of course, is an important consideration for telepresence, especially when remote manipulation is involved. Signals between object and eye, between glove and manipulator, cannot be delayed by more than a few milliseconds if the illusion of true presence is to be preserved. This means that links involving geosynchronous satellites must be avoided. Low-delay transmissions, preferably over fiber-optics land-lines, are preferred. However, telepresence even to a space station in low-Earth orbit is not ruled out, provided an interrupt free low-delay communications link to the space station can be maintained. This means that, at least in principle, all of us could visit space stations in low-Earth orbit using a telepresence link to a remote unit on the station. We could perform micro-gravity experiments or do maintenance work on the station. We could go for a spacewalk, or look down on the Earth as it passes underneath, or participate in zero-gee sport activities. Similarly we could go for an underwater walk along the Pacific Rift, collecting samples as we went. The remote machinery for doing these things, once developed, is likely to be simpler than the space suits and deep diving equipment needed to put humans in the same locations, since the complications of life support, of transporting an Earth-normal environment into space or to ocean depths, would be eliminated.

As a practicing physicist, I have a considerable interest in the development of telepresence with good manipulation capabilities. A physicist like me, who works at a university, has commitments for teaching and other responsibilities requiring him to be on campus, even though his research in nuclear or particle physics often requires his presence at a large accelerator located at some accelerator facility (e.g., FermiLab or Brookhaven) that may be on the other side of the continent. It's usually necesary to make frequent trips to such facilities for experiment runs, group meetings, planning sessions, seminars, and presentations of proposals for new experiments. In the process, great quantities of time, effort, and research funds are consumed in the intrinsically unproductive activity of moving one human being to some distant location and back.

With telepresence, as I expect it to be developed in the next decade or so, this will change. I'll be able to sit in my office at the University of Washington

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and at the same time work in a high radiation field to test the operation of an ongoing experiment at the Superconducting Supercollider in Waxahachie, Texas. Or, with a telepresence proxy wearing my face on its video screen, I can be attending a physics conference in Bombay. Or I can be changing the parameters of a micro-gravity crystal growth experiment on the space station. Or I can be hauling a buoyed column of photomultiplier light-sensors across the floor of the Pacific to enlarge an ultra-high energy neutrino detector array. All this without leaving the campus. I can hardly wait!

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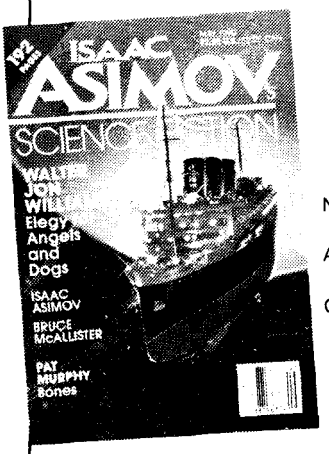

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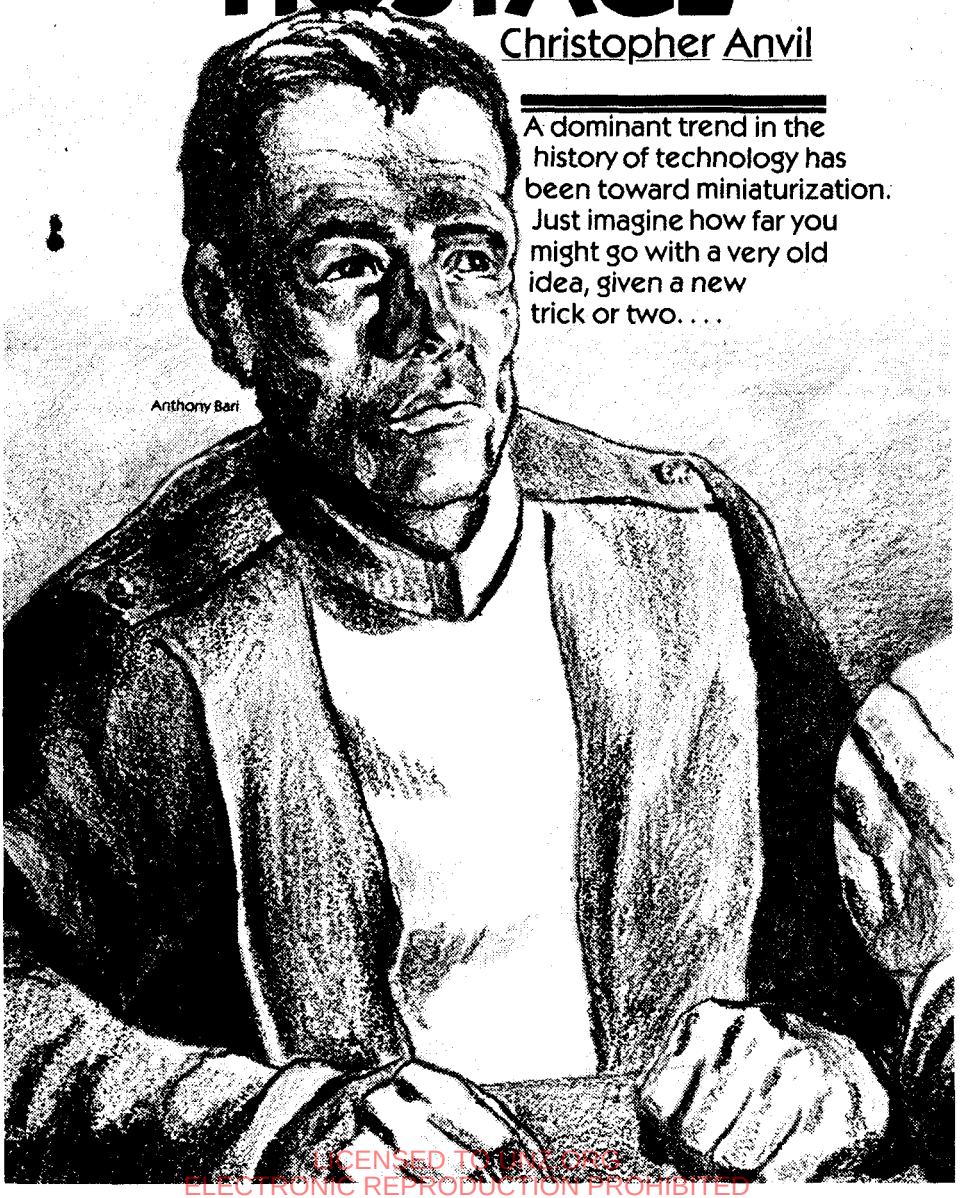
THE TROJAN HOSTAGE

Christopher Anvil

A dominant trend in the history of technology has been toward miniaturization. Just imagine how far you might go with a very old idea, given a new trick or two. . . .



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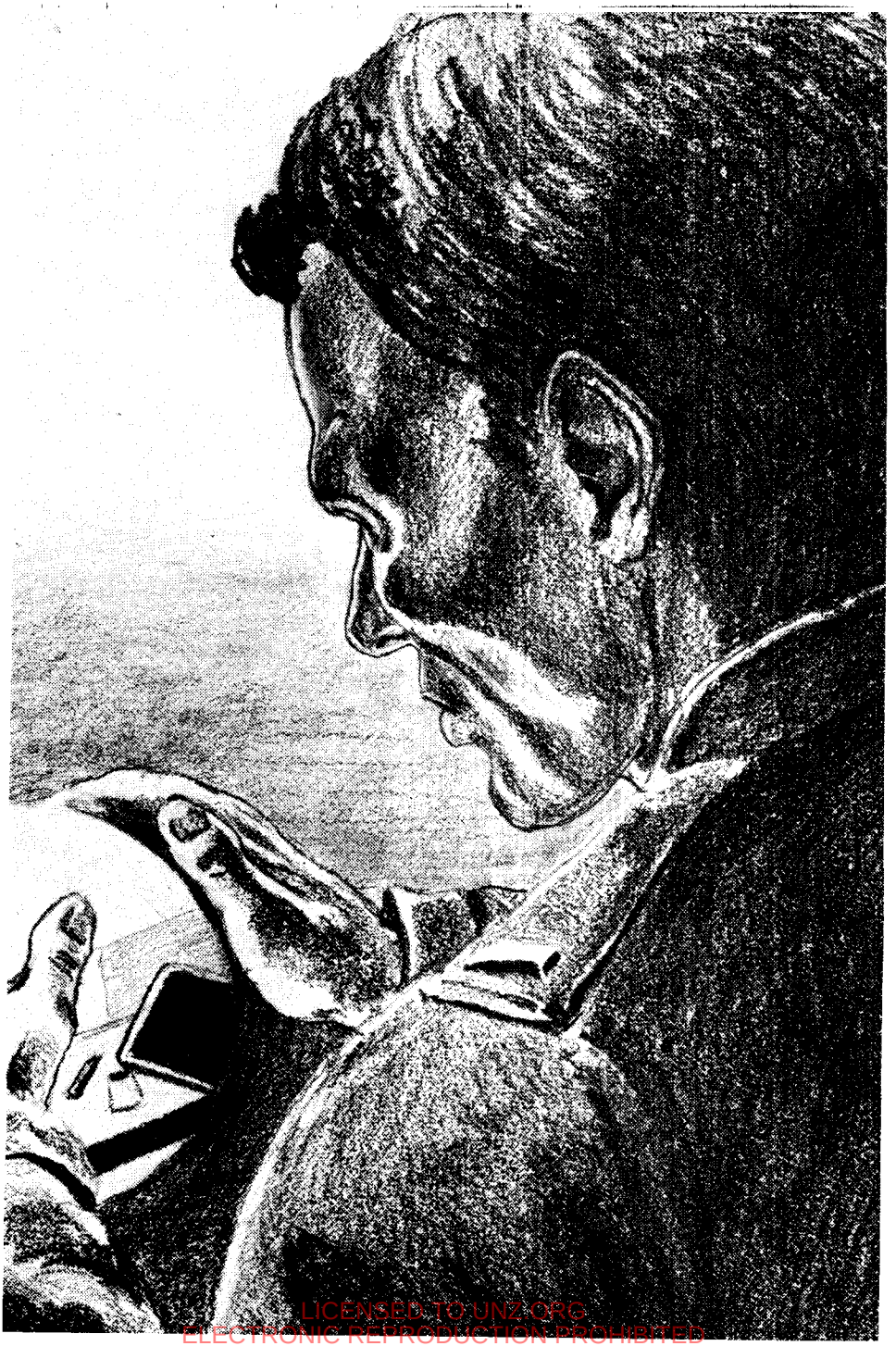

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The blow to the head came without warning, and knocked Roberts against the white-painted concrete-block wall of the spaceport washroom. A second blow followed so fast that he was unconscious before his body hit the pitted, urine-smelling floor.

Roberts's arms were jerked behind his back, steel cuffs clamped on his wrists and ankles, and a heavy padlock slid through the links to bind his hands close to his feet. He was lifted, carried through a door, and slid along a truck bed sheathed in iron. The door clanged shut behind him. With a jolt, the vehicle started forward. Roberts was unaware of any of it. The roar of the departing ferry rocket, that had brought him to this world less than an hour before, passed over him unheard, just as it passed over the sand, the rocks, and the weeds growing in the shellholes beside the road.

Roberts had been none too happy when the chief of operations had first suggested the plan. Seated before Colonel Sanders's desk in the Interstellar Patrol dreadnought that served as command ship, Roberts hadn't concealed his doubts:

"Sir, I can see it might not be right to just kill the lot of them. On the other hand, at least it would work. This—"

The colonel shook his head. "Amongst other things, if we kill this lot of homegrown barbarians, just possibly we might kill our own people being used as shields. A little subtlety is called for."

"Subtlety may not work. But if we make an example of the worst of these macho bandits, the rest should be more cooperative."

"Unfortunately, they aren't stupid. Before you hit them, you have to find them. And we want our people back alive, if possible. In any case, we want to handle this in such a way that, afterwards, no one will be overeager to use us for shields, or for trades in an interstellar prisoner swap." The colonel handed Roberts a sheet of paper. "A little of this is plenty."

Roberts found himself looking over a copy of the news-sheet that had popped out of innumerable printers at breakfast. One of the articles was circled:

IP AT BAY

—

HARSH ULTIMATUM

The Interstellar Patrol, the shadowy quasi-military organization that for many people represents the ultimate human power in the universe, finds itself today at the mercy of a band of anarchists.

FIAM, the Freedom In Anarchy Movement, founded by imprisoned planetary raider Ian Pulgor, today announced the capture of twenty-seven IP members in a raid carried out late last month on the planet Tiamaz.

In a terse ultimatum, FIAM warned:

" . . . These prisoners, who have now been fully questioned, will be killed one by one until Colonel-General Ian Pulgor is released unharmed from the detention facility. . . . "

The IP members had apparently been on leave on Tiamaz, the popular gaming and vacation planet, and were seized, the FIAM spokesman

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reported, without casualties to the Shock Troops of the Movement.

FIAM Shock Brigades VIII and XVI are reliably reported to have returned with their hostages to the Movement's bleak and desolate home planet of Anarchy. . . .

Roberts skimmed the rest of the article, then looked up.

"You want me to *volunteer* to carry out 'a check of the physical condition of the prisoners'?"

"Correct, Roberts. The proofs the Pulgorites sent included photographs evidently taken on Tiamaz, details of build and age, fingerprints, a few sets of retinal patterns, and messages anyone could have fabricated. The total seems convincing, but all it really shows is that someone has investigated these men. That doesn't prove they've been captured. All these so-called hostages could actually have been killed in the raid on Tiamaz."

Roberts nodded. "If the reports are right, a good part of the casino district was blown to bits."

"And the main part of the resort our people were staying at was vaporized. The Tiamaz authorities think upwards of ten thousand visitors got killed in that blast alone. We could humbly do as we're told, then find that the killers had parleyed a witless slaughter into a victory through a faked kidnap. As a matter of fact, they may already have killed all of our men."

Roberts nodded. "They may have no hostages *now*. But they will have, if I go to check up on them."

The colonel nodded matter-of-factly. "That's true, Roberts. Namely, you."

"That's my point, sir."

"But you see, Roberts, we need to find out for certain whether they do have prisoners. However unlikely, we have to check that possibility."

"Sir, I'm prepared to risk my neck. But you are asking for a volunteer. I won't volunteer to be the one they boot around to soothe their egoes, and then trade for the colonel general."

There was a little silence, during which Roberts saw no interpretable expression on Colonel Sanders's face, but nevertheless got the impression of a backwoodsman switching baits in his trap.

"Roberts, they have *guaranteed* the personal safety of any representative we might care to send, specifically the safety of Captain Vaughan N. Roberts, I.P."

"I'd as soon sleep with the crocodiles as trust that guarantee."

"Trust," growled the colonel, producing a uniquely unpleasant smile, "was not exactly what I had in mind. The odds are that they've killed no less than twenty-seven of us. We aren't handing you over to them as a free gift. I hope you don't think that."

"Sir, from what I've heard of this plan so far, suicide looks good by comparison. I suppose there's something you don't want to tell me, because if I don't know it, I can't reveal it. Well, maybe someone else will volunteer."

"Roberts, there is a very real risk for you. But if you should become their hostage, the risk to them will be worse."

Roberts felt the curiosity this statement naturally roused. And like a predator noting tasty bait in a deadfall, he moved on. "If I had some idea why that

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should be, it would be different. But why hand myself over as a prisoner to this bunch of murderous lunatics, for no reason I can understand?''

''Well, the reasons are clear enough. First, we have to know whether our men are or are not prisoners. If they are, we aim to free them. If not, we will take care of whoever killed them. But before we do either, we have to find out what happened, and that is the second problem. Third, what *is* this 'freedom in anarchy' movement? There are possibly a hundred crackpot organizations, born of a combination of frustration and a lack of historical perspective, to each organization that makes sense. Which is this? We need information, and this outfit is cunning and secretive. We have drugs that would, amongst other things, induce them to talk freely, but first we have to make contact. They won't come to us. So—''

''Where's the connection between handing me over to them, and your getting the answers?'' Roberts shook his head. ''Are their so-called Shock Troops back on Anarchy?''

''That's the information they've leaked out.''

''I'll volunteer for the first wave to hit the place.'' The colonel shook his head. ''If it were that simple, the Space Force would have wiped them out long since. It isn't a question of force. The problem is that they are *clever*.''

Roberts considered the peculiar expression on the colonel's face as he spoke the word ''clever.''

''There must be quite a few things I don't know.''

The colonel looked at Roberts with exasperation, then sighed and nodded.

''These *are* very clever people. They are shrewd swindlers and cunning bushwhackers. But there's more than one way to use brainpower. For years, we've been doing research on jump-points—what R-Branch refers to as 'singularities in space.' These things are used regularly to cut travel distances and lower freight rates—you shoot the freight through jump-point Ceres, say, and it comes out on the other side for a total two-month trip instead of one that takes six years. In effect, two different locations in space are joined, and the join can be used as a shortcut.''

Roberts felt the disorientation of the desert traveler, prepared to endure heat, glare, and blowing grit, who trudges over a sand dune to find blue ocean in front of him.

The colonel, outwardly unaware of the effect of this change of subject, was going on: ''Now, how does this work? What are the principles behind it? Could the principles be used differently? Could we, perhaps, find a way to create this kind of effect ourselves?''

Roberts said warily, ''As I've heard it explained, sir, there are at least two parts to the theory. One has to do with the curvature of space, and the other with the effects of unusually intense gravitic fields. In short, an extremely concentrated gravitic field may make a hole from one section of space to another. But what does this have to do with the Pulgorites?''

''Do you know of a theory that would enable you to *construct* a jump-point?''

Roberts looked blank.

The colonel said, ''Without gigantic masses of collapsed matter, Roberts, or huge magnetic or gravitic fields—using

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tiny intensely focused gravitic generators controlled by ultraminiaturized processors, the whole works small enough to fit in your pocket, and all perfectly safe and inoffensive when you put it there—that is, if you leave it turned off."

He reached into the top drawer of his desk, and tossed across a thing like a small mother-of-pearl spoon with no handle, about an inch and three-quarters long by an inch at the widest, with a smooth slick surface that felt faintly warm to the touch.

"That, Roberts, is a demonstration unit in the larger size. Put your thumb in the center where it's dished in, with the palm of your other hand on the opposite side, and press hard."

Roberts did as told.

Abruptly his hands were pushed aside, there was a six-inch hole in the air, and Roberts, his mind numb and hands pressed against a hard unseeable edge around the outside of nothing, was looking through the hole into some other room where there was a laboratory bench on which lay a hand slate and, beside the slate, a stick of white chalk.

The colonel said, "I can't see it from here, Roberts, but you should be looking into R-Branch's molecular physics lab. The usual connection is near a bench with something on it like a pencil, puzzle cube, or some other small object."

Roberts stared at the colonel, then leaned forward to look at the hole from the colonel's direction—and found he was looking through the space where the hole had been and it wasn't there any more. He sat back, feeling foolish, and there it was again, and, inside it, the top of the lab bench.

The colonel said, "Our original model was not only invisible from the back, and unstable, but had a rim like the edge of a razor blade. This is better, believe me. But it's still invisible from the back. It's almost as if you had a small hatchway, with one side in one location in space, and the other side of it in a different location."

"What happens if I try to reach through this hole?"

"Try it."

Roberts, expecting something like a closed window or porthole, cautiously put his hand in, met no resistance, reached through, picked up the chalk, and then the view shifted, his hand and half his arm disappeared, and the inner edge of the hole dropped free of his other hand to rest on his arm like a small, light, unseeable hoop. It dawned on Roberts that he had been trying to hold it with one hand and must not have gripped the edge tightly enough.

The colonel stepped out from behind his desk. "Don't move, Roberts. It won't hurt you, but we could have trouble finding it if it lands wrong side up. It's thin, and transparent from the back." He put his wide open hands on opposite sides of the outer edge of the hole, fingers spread, lifted it up, and Roberts withdrew his arm and opened his hand, the chalk resting on his palm.

Roberts felt the chalk, glanced up at the colonel patiently holding the device, then reached back through, returned the chalk, briefly weighed the hand slate, then pulled his arm and hand back out. He gave a low, fervent exclamation.

The colonel said, "Now, put your

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hands back on the outer edge, and press. Keep increasing the pressure."

Roberts put his hands on the outer edge of the hole, pressed lightly, and nothing happened. He pressed harder, and the circular rim resisted, then abruptly collapsed to an oval, then, by stages, to longer narrower openings, then the lab bench was gone, and he was holding the little rounded dished-in bit that looked like mother-of-pearl.

The colonel sat down behind his desk.

Roberts exhaled slowly. "You say this is the 'larger size'?"

"Correct. The smaller size would fit easily on the nail of your little finger."

"There are just two sizes?"

"There seem to be two *limiting* sizes. At best, they aren't easy to make. And when we try to use this method for one much larger or smaller, the border wavers, and sooner or later the connection breaks down. But we now have several sets of these space-connectors that are reliable."

"What's on the other end, in the lab?"

"A second unit, keyed to the demo unit you've got there. The second unit is ordinarily kept turned on, and mounted in a circular holder that fits tightly around its rim. Both units have to be turned on for the connection to function. When your unit is off, the other just looks like a short pedestal mount holding a rim that you can look through—like a mirror frame with no mirror in it. When your unit is turned on, you can see from the proper side a six-inch hole into the place your unit is in. In this case, someone in the lab could look—and could reach—into this room."

Roberts sat looking at the little curving piece like mother-of-pearl. "Suppose one place has a much heavier gravity than the other?"

"If you reach through, you might feel it. If there's a higher atmospheric pressure in one of the places, there will be a flow of gas from the higher pressure toward the lower. R-Branch says they've found no measurable effects due to relative velocity, or to a greater potential energy on one side of the connection."

"Meaning?"

"If one connector were to be put, say, in a fast-moving satellite, and the other were motionless on the ground below, you'd expect an object passed across from one side to the other to come through with high velocity. It doesn't. Any difference in velocity, or potential energy of the places joined, seems to be absorbed. R-Branch tells me there are theoretical difficulties, but it's as if places joined were motionless with respect to each other."

"Suppose something is thrown through from one side to the other?"

"It goes through as hard as you throw it."

Roberts thought it over, frowning: "How far apart can the places be that you connect?"

"We have yet to find the upper limit. Whatever it may be, the Pulgorite planet, Anarchy, is well within it." He added, with no special emphasis, "The connection is made, Roberts, by having someone go to the place with the device."

Roberts considered that for a while, then he smiled, and looked the colonel in the eye.

"Sir, I volunteer to check the phys-

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ical condition of the hostages the Pulgorites claim to have taken."

Roberts became aware of voices, and of a muted throbbing somewhere in his head. He tried to move, and found that he couldn't. He managed to partly open his eyes, and a white light was glaring down from overhead. In the light, a short, very sharp knife glittered as a square competent hand held the knife out, and a more slender hand took it, and passed over a clamp, then another clamp, and another.

A male voice spoke quietly: "That's it."

A rougher male voice said, "Find anything more?"

"There are no artifacts actually inside the body itself, so far as we can determine."

The rough voice grated. "I asked you if you'd found anything more."

"No, sir. We did not."

"Just a minute, Surgeon. When I ask a question, I expect an answer in a certain form. And I will either get it, or you will find that those hands you're so proud of will break easily. Understand?"

"Yes, sir."

"All right. Now I'll ask you again: 'Find anything more?' "

"No, sir."

"What chance is there that something has been miniaturized, or that there is something there made to resemble body tissue?"

"I don't know, sir."

"But you don't see anything?"

"No, sir."

"Nor any sign that anything was inserted?"

"No, sir."

"Everything looks normal to you in the body cavities?"

"Yes, sir."

It dawned on Roberts suddenly that they were talking about him. It was him that was stretched out on this table.

The harsh voice said, "Does it mean anything to you, Surgeon, that that slab of meat you're working on represents victory for the Movement? *If* we can block every one of their dirty little tricks?"

"No, sir."

"No. You're not one of us. All right. Sew him up. And he'd better live long enough for us to wring the juice out of him."

"Yes, sir."

The rough voice grated. "Did I just ask you a question?"

"No, sir."

"Then shut up."

There was a silence, then another male voice spoke nervously: "Request to increase the anesthetic. The patient is regaining consciousness."

The rough voice answered, "We're short on anesthetic. To hell with him."

The surgeon said, "I can't promise the patient will survive if he becomes conscious in this situation."

"He's in the IP. They're tough."

"In this situation, no one is tough."

There was a silence, and it penetrated to Roberts that he was lying on his back opened up on a table while an argument took place whether he could have anesthetic.

There was the sound of someone spitting. "All right," said the rough voice. "Give him some more gas. But you'd

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damned well better not waste it on him."

Roberts smelled something sweetish, and instantly passed out.

Somewhere nearby, a coldly sneering male voice was saying, " . . . don't know what's wrong with Guff and Petzky. They were OK when they brought the jerk, here, to the blockhouse. But now they've got chills, fever, and the shakes. I've got a ton of blankets on them in there. Guff is starting to hallucinate."

A feminine voice said, "Sounds like they've got the grakes."

"The what?"

"Grakes. In the settlement where I grew up, every spring at least half of us would come down with it."

"Never heard of it. What is it?"

"Chills, fever, and shaking. The worst is, you have vivid dreams. Well—vivid nightmares."

"What causes it?"

"I don't know."

"How do you cure it?"

"We never found a cure. You just endure it."

"Great. Those two are worthless, then. For how long?"

"It usually took us about three or four days to get over the worst. By the end, we were worn out."

Roberts eased his eyes to narrow slits, to see the small passenger compartment of the tug that had brought him to the surface of Anarchy. Since this tug served as a kind of shuttle between the planet and the nearest space station, and had been about to leave the planet as Roberts had stepped into the spaceport washroom, it followed that the tug had taken off, returned later, and Roberts had again been put on board. Supposedly this would have had to take a good deal of time.

Up front, one of the cabin lights was shining on a metal trim-strip. Roberts's head moved slightly, the strip glittered, and Roberts suddenly remembered the surgical knife, and realized where the time had gone. The realization was followed by urgent thought, and the memory of the colonel's voice:

"Needless to say, Roberts, there are limits to what we should tell you in advance. But you can expect to be very thoroughly searched on arrival. Naturally, we will be prepared, so don't worry about that." It occurred to Roberts to wonder just how thorough an examination the colonel had expected.

Beside him, now, the male voice was saying, "What are the odds on this sucker catching it?"

The feminine voice replied, "The grakes?"

"What are we talking about?"

"You tell me."

"Guff and Petzky were carrying him, and they're both down with it. Could he get it from them?"

"I don't know why not. I'd think the odds were good."

"Does it kill?"

"Sometimes."

"So, after all we went through to catch the bastard, he could die on us before we've used him?"

"People in bad shape were the ones who usually ended up dying. The rest of us only felt like it."

"Well, he's already been sliced open, so that will weaken him. And they're

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putting him through a full-suite psycho battery when we get him there."

The feminine voice said judiciously, "It *might* kill him. The hallucinations can be really hellish."

"I don't mind putting him through hell. I just don't want him to die on us before we're through with him."

Roberts opened his eyes.

Beside him, the male voice gave a low chuckle. "Well—the sleeper awakes. Give Prince Charming a kiss, Ginette."

The feminine voice spoke softly. "I'd love to."

There was a faint hissing sound, as of a spray can, then a feeling of cobwebs brushing Roberts's face and shoulders, then a pain that blotted out the headache, and brought Roberts wide awake. For an instant he was on his feet, straining at a wide band that covered his chest and arms, and another band that bound his legs together. Then a particularly agonizing pain warned him that, just a little while before, he had been on an operating table. He felt a great weariness, and his eyes went shut. As he fell back into the seat, the soft feminine voice spoke from his left: "Sully? Again? There's still plenty in the can."

From his right came the sarcastic masculine voice: "Oh—not just yet. Keep it handy. We'll have a few questions, and if he acts too smart, we'll give him a squirt. After a while, you can make a hiss with your mouth, and he'll jump."

The girl giggled. "Fun."

Roberts gave an involuntary shuddering gasp, got his eyes open, and saw that he was wearing a kind of hospital robe partly pulled down over his bare shoulders, and that the passenger compartment was empty forward of his seat. To his left was a pretty woman of perhaps twenty-five, slim, dark-haired, demure, pertly holding what looked like a can of insect repellent. To his right was a well-dressed man of about forty, wearing a dark business suit. Both of them looked highly respectable.

Roberts recovered from the mind-stopping pain, and his instinct for self-preservation prompted him to try to distract this pair. The best he could think of was to get them talking. He turned to the man. "This ship is grounded on Anarchy?"

A look of contempt lit up in the man's eyes, and then there was a very faint hiss. Roberts's muscles tightened of their own accord. He turned around toward the girl, who favored him with a sweet smile and suggestively raised the can. The hiss was still going on, but she wasn't causing it. It was a faint hiss that he could just hear in his right ear. As he turned back to face the man, the hiss suddenly stopped.

His well-dressed seatmate had a look of glazed puzzlement. He hesitated, appeared to be groping mentally, then shrugged. "We're in flight. The so-called home planet is well behind us."

Roberts alertly studied the glazed expression, then said, "I thought the prisoners were being held on Anarchy."

"Why should we make a target you could hit? You know where Anarchy is. We said they were there, so they aren't."

"There was an announcement that the Shock troops who carried out the raid had returned to Anarchy."

"We make statements to mislead. Why give free information to our enemies?"

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"The Interstellar Patrol is your enemy?"

"We killed twenty-nine of your people. Sure you're our enemy. We didn't intend it, but we might as well make the most of it."

"Twenty-nine?"

"At first we thought there were twenty-seven. But the records show a K-class IP ship was on the planet, along with the G-class ship we'd known of. The K-class ship had a crew of two."

Roberts kept his voice casual. "What records do you mean?"

"The Tiamaz internal security records. The planet has probably the best internal security of any planet not run by a dictator—and it beats some of *them*. We aimed to get the records. We did get them. That part, at least, worked."

The girl leaned across Roberts. "Sully, *he's* questioning *you?* Shouldn't we be questioning him?"

"Why do I want to ask questions? They've got a bunch of experts lined up for that."

"Yes, but—"

His tone was offended. "But what?"

"I thought—"

"Thought what?"

Listening to this exchange, and seeing the angry, defensive and still glazed look on Sully's face, while the girl looked incredulous and angry, Roberts remembered the faint hissing sound in his right ear. He felt a sensation as of chills and fever. He twisted around in his seat—no small achievement considering the bonds, the aches and pains, and the girl's raising of the spray can—and said, while looking over the back of the seat, with his right side turned toward the girl, "Are we alone in here?"

She said, ignoring Roberts after one quick puzzled glance, "Sully, are you all right?"

There was no one in sight in the seats behind them. Again there was a faint distinct hiss, which went on for some time, to end only as he turned toward the front again. As he turned, Sully was saying resentfully, "I'm in charge here. You understand that, Ginette?"

Roberts automatically braced for her sharp response.

The girl said meekly, "I understand, Sully. I just wondered, that's all. I'm sorry."

Roberts's sensation of chills and fever produced an actual shiver as he recognized the unlikelihood of this submissive reply. Like Sully's cooperativeness, it followed closeness to the right side of Roberts's face—more specifically, closeness to his right ear. Moreover, there was a distinct unmistakeable sense of coldness in his right ear. Not for the first time, he damned the colonel's reluctance to give information, and his own willingness to act without getting it. Thanks to that failing, though he now had an idea what was going on, he didn't actually know, and might make a slip anytime. He turned to Sully, and casually asked, "What was the point of the raid?"

Sully sighed, and settled back. "We intended to replace the internal security on Tiamaz with our own people. It didn't work. But we did get the records."

Roberts stared at him. "You were going to take over Tiamaz?"

"Just the internal security section."

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"But you couldn't stop there. The planetary government wouldn't have put up with that."

"Why not? Tiamaz is run by a syndicate of financiers, gamblers, and entertainers. Naturally, we weren't going to tell them we were taking over the planet for Colonel-General Pulgor. We were going to tell them we represented Intergalactic Security, a competitor of Transspace Security—the outfit they'd contracted with—and that we had spotted a hole in Transspace's security set-up, and pushed Transspace out of there. Then we'd offer to take on the security contract on the same terms, and do the job right. What do they care who does the work?"

Roberts, suffering from a severe headache, a number of pains and twinges, and a general feeling of weakness, asked himself if his own physical shape might be the reason for his difficulty in following this explanation. He cleared his throat.

"But there *is* an actual Intergalactic Security. What were they going to do when they heard about this?"

"Why should they complain? Tiamaz is a big contract. What do they care if Transspace gets a bloody nose? What Intergalactic would want is the money."

"Yes, but wouldn't they be surprised to find out they had a branch office they didn't know about?"

"Oh, sure, but we weren't going to tell *them* we were from Intergalactic. Hell, no. We'd tell them we were an independent outfit called Unicorn Investigations. We'd already set Unicorn up, so, if they checked, that was documented. We'd say we'd found holes in Transspace's set-up, penetrated it, and Transspace had resisted, and one thing had led to another, and we'd had to clean out the whole operation. Now we wanted to affiliate ourselves with a real professional security outfit, and would they take us on as part of Intergalactic. Then they'd ask who gets the payment, and we'd say they did, and they could pay us at their wage rate, and we figured they'd jump at it. Tiamaz is a gold mine."

Roberts remembered the peculiar expression on the colonel's face as he said, "They're *clever*." He grappled with this explanation, and asked himself if this could have worked. With a sense of shock, it dawned on him that it appeared so tailored to the greed or ignorance of everyone involved that it just might have worked, at that.

To his left, the girl sighed, and settled back, and the girl's sigh seemed loud, while the man's voice seemed somewhat low, as if Roberts's right ear were partly plugged. Automatically, he tried yawning and swallowing to clear his ear, then realized that wasn't going to work, and said, "So, you'd finish off the team from Transspace, and try to join up with Intergalactic?"

"Correct."

"How about Transspace?"

"As soon as we'd wiped out their people, we'd send Transspace a message over their planet chief's name, saying we'd gotten a better offer from Modular Investigations, and had accepted it as a unit."

"This would be a message supposedly from Transspace's people on Tiamaz?"

"Right."

"The ones you'd just killed?"

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"Sure. They couldn't deny it."

"What—"

"Transspace wouldn't know what to think. Because there *is* a Modular Investigations, but it's halfway around the universe. If Modular needed people to work in some place far from home, this is just what they might do."

"So Transspace might believe it."

"Might. They wouldn't know."

"Couldn't they check?"

"Sure." He chuckled. "They could ask Modular."

Roberts considered the chuckle. "Ah—"

"Naturally, Modular would deny it."

"The—"

"They'd deny it either way, whether they did it or not."

"But if Transspace believed they had a message from their own chief of planet, naming Modular, why would they doubt—"

"How do they know whether *he's* lying? He could have joined some other outfit, and named Modular to lay a false trail."

Roberts considered it in silence. "All right. Suppose Transspace got in touch with *you?*"

"Ah, we'd have loved that. We were Unicorn Investigations, and we'd done a small job for the Transspace outfit on Tiamaz, and their planet chief had got in touch with us, and asked how we'd like to fill in on Tiamaz for them, and we'd asked why, and he'd said he'd had an offer from Pilgrim Protective, but don't repeat it, and so we'd gone to Tiamaz, and the planet chief had eased us into the job, and then left with Transspace's people, and here we were, and he'd suggested we get in touch with Intergalactic, and we'd done it, and Intergalactic had asked no questions and just taken us on. Naturally, we wouldn't tell them this all at once. We'd let them dig it out, a piece at a time."

Roberts sat back. "There *is* a Pilgrim Protective?"

"You bet."

"So Transspace would—"

Sully chuckled. "Probably they'd just drop it. They'd have a sweet time checking it out."

Roberts exhaled carefully. On top of his pains and general sense of enfeeblement, he was suffering from a growing impression that he was mentally dull, and badly out of step with the latest progress in crime.

"Did you," he asked, "work this all out yourself?"

His seat companion smiled with quiet pride. "Oh, we all had input. Where you have to be careful is getting rid of the bodies."

"How—?"

"We left that to Marty. He's careful. It's better if not too many know just what happened."

"Yes, I guess it would be, at that."

Roberts sat back, and gathered his mental faculties together. He had the impression that he had to get out and push to get them to work. Stubbornly, he went through the explanation again, trying to pin down just what it was that seemed to be lacking. Let's see, he thought, the Movement kills Transspace's people on Tiamaz. They send a false message so Transspace will think their people have quit their jobs. The Movement tells Tiamaz that they work for Intergalactic. They tell Intergalactic they are a small outfit and want to join

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Intergalactic. They agree that, in exchange, Intergalactic can have the lavish payment from Tiamaz, while, for its part, Intergalactic will pay their wages. Roberts thought that over.

No matter how he examined it, it appeared to Roberts that, after a complicated string of lies, murder, and trickery, the payoff was that the Movement had got into a position where now it could work for Intergalactic.

"What," said Roberts, "would you get out of this?"

"Me, personally, or the Movement?"

"The Movement."

Sully smiled expansively.

"Think of all the important people who come to Tiamaz, how they can be set up while they're there, and the information you can get on them. There's a lot of angles there. Then there are the entertainers. Just for starters, we had a show on the colonel-general's life—a sympathetic show—and someone from Anarchy was going to take it around to the entertainers. If any one of them would handle it right, we—internal security—would help that entertainer. There was a lot we'd be able to do to favor one of them over another after we'd been around a while."

"That was a public relations gimmick? To build up your leader's reputation?"

"Sure, why not? All these influential people pass through Tiamaz. If you're on Tiamaz, you've got a handle on them, not to mention the information you can use or sell."

It occurred to Roberts that being told all this would do nothing to improve his chances of getting home alive to repeat it. On the other hand, he *was* being told, and just possibly he was not the only one hearing it. He cleared his throat.

"What went wrong?"

"It never occurred to us there would be off-duty police or troops there. All we expected to run into was Transspace, and maybe the local police. But there was a platoon of Space Force combat infantry in civilian clothes taking their furlough there, and the two IP ships we didn't know about till later. Then there was something else—we don't know what it was—and the scam turned into a shambles."

"What happened?"

"The idea was to do away with Transspace's operatives—all of them—in about a three-hour period. The problem was to keep it quiet. We had their schedule, and one of our own people was their dispatcher on duty. We knew where everyone on duty was going to be, they didn't expect trouble, and the dispatcher could pull in the people off duty when it suited us. It should have gone like silk."

Roberts, soberly considering it, could see the point. "But it didn't?"

"What we didn't know was that two of the Transspace women operatives had made friends with a couple of Space Force sergeants. That is, we knew they had boyfriends, but it hadn't dawned on us that the boyfriends were combat troops with buddies all over the place. When we tried to get rid of those female operatives, all hell broke loose. To make it worse, some Space Force men had got friendly with the IP, taking their own vacation there, and they got in it, too, and damn it, no one is supposed to be armed on Tiamaz except the Tiamaz police and internal security—but

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several of these holier-than-thou IP bastards had guns."

Roberts murmured, "Oh, unfair."

"Well, if *they* don't obey the law, who *can* you trust?"

"What happened?"

"We cleaned out most of Transspace, but the two women caught on, warned the rest, and it was like a nature vacation where you go to shoot the tame rock hen for dinner, and waiting there for you is a giant constrictor. The Tiamaz police got in it along with the Space Force and the IP, and what was left of Transspace. We loaded up the Transspace files, blew up the internal security headquarters, and on the way off the planet a big IP ship came at us low and fast, we fired everything we could throw at it, accidentally hit some building on the edge of the casino district, and that went up like a torch with the IP ship right over it, and this building and the IP ship blew up. We don't know what happened. But we were far enough away to live through it, and it did so much damage we thought it would build up our reputation to claim the credit. After that blast, anyone who knew what was going on was probably dead, so we could claim anything. So we called it a raid."

"The hostages—?"

"The last thing we were thinking about was hostages. We wanted out of there with a whole skin. What we said afterward was just to look good. See, we're not scared of the Patrol. First we question them. Then we kill them, one at a time. How is anyone going to know what happened? Of course, now we *have* got a hostage. You."

Roberts noted that the glazed expression was wearing off, and Sully was now acquiring a faintly puzzled look—possibly as if he wondered just why he was telling Roberts all this. Roberts nodded moodily. "These—ah—Shock Troops—?"

"Same idea. Like the colonel-general's rank. He's got followers enough in the Movement so he could claim to be, maybe, a lieutenant or even a captain. How's that sound—Lieutenant Pulgor, Supreme Commander? You can hear the press: 'In a dramatic development today, First-Lieutenant Pulgor announced that his troops, based on the home planet of Anarchy, will destroy any commercial traffic in the region.' —Kind of unconvincing. You don't dare do that unless you've actually got the power. So he reached into his imagination, and now he's a Colonel-General. We got the Shock Troops out of the same place."

It occurred to Roberts again that this frankness did not bode well for his longevity. He waited until a particularly vicious jolt of pain passed, and until the detestation he was beginning to feel for his seat companion died down a little, then he cleared his throat.

"So, obviously, there is no point in my checking the condition of prisoners."

As if the words were some kind of signal, the girl at once lifted the spray can, and aimed it at his face.

The man noted Roberts's wince, and laughed. "Not yet, Ginette." He glanced at Roberts. "You see, we're pretty sure the IP isn't actually stupid. The Space Police—by and large, they're stupid. The Space Force? Well, it depends. They're one-sided. You get in the way of their specialty and they're anything

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but stupid. But they just fight outsiders, so we don't have to worry about them. See what I mean?"

Roberts noted the complete disappearance of the glazed look, nodded, kept his mouth shut, and listened.

"Planetary Development? It's full of smart people, but the organization is birdbrained. But except when they take over a settled planet, that's no problem. Obviously, as the colonel-general says, we need to get rid of the Space Police. You can't have real individual freedom—Unrestricted Individual Freedom—Anarchy—with police around. And Planetary Development's regulations have to be changed so they can't interfere on a planet after it's settled. That's all. But the IP?" He looked at Roberts.

Roberts kept his mouth shut, and looked attentive. His seat companion nodded.

"We don't know. We don't truly know what it is. But now we've got a grip on a piece of it, and we aim to find out what the IP *is*. Maybe we can use it. Or maybe we have to eliminate it. For all we know, it's a secret government, the very opposite of anarchy. *You* may be a part of anti-freedom. We have to find out."

Roberts observed the bright glow in his seat companion's eyes, looked around, and saw the spray can aimed at him, and glanced back to the man, who was smiling. The silence began to stretch out uncomfortably.

"How," said Roberts, "do you find out?"

"Well, like I say, we're a small organization. But we have some shrewd people. As an organization, we're sharp. A lot sharper than the IP. You see, we trapped you because you couldn't be sure we didn't have some of your men as prisoners. You probably didn't really believe it, but you had to be sure. Right?"

"That's a fair statement."

"You bet it is. Now we've got you. The rest of the Patrol knows we've got you. When we send back a finger, they'll know it's your finger. When we send back an ear, they'll know it's your ear. We can stretch that out a long time. They won't be able to bear it. Sooner or later, they'll attack. That's when we'll get some more hostages. Because, where are they going to attack? Why, Anarchy, of course. Everything will be datelined Anarchy. The press will have interviews there. It's established that we're there. But, of course, we're not. What is there is a few of us and a damned big booby trap. Ordinarily, I suppose the Patrol wouldn't make a land attack. They could just pull a warship into range and blast us from a distance. But we've got *you*. They'll *land*."

Roberts considered the words, 'When we send back a finger, they'll know it's your finger,' and reminded himself that if he got out of this in one piece, in the future to be a little more restrained when the next chance came along to volunteer. He said, as if uncertain, "You can't be sure they'll land."

His seatmate looked exceedingly shrewd. "Well, I think they'll land. You'll be surprised how we'll play them. And when they land, the odds are we'll get a few of them, anyway. They'll suffer heavy losses. And then they'll realize they don't know where we are. We'll find out just what the IP

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is like. And we'll get the colonel-general free in the process. It'll tear the IP to bits. And you're the start." He looked at his watch. "OK, Ginette, give him a dose."

There was a hiss, a sense of brushing into cobwebs, and an agonizing pain. The hissing kept up, and the pain knocked the vague hopefulness Roberts had started to feel out of his mind, spread over his exposed head, neck, and shoulders to turn into one livid blinding agony—and he was unconscious.

This time when he came to, Roberts had a distinct sense of the passage of time. His first clear conscious thought was—"Don't volunteer!" Then his eyes focused, he remembered the operating room and the space tug, and realized he was no longer on the space tug.

The room he was in was large, the plastered walls water-stained, and the ceiling high. The closed doors were paneled, dark, and set in massive frames. Here and there, plaster had fallen, to give the impression of a mansion in ruins. Roberts himself was lying on his back in a double bed with several woollen blankets on it. Watching from across the room by a high closed window was the girl who had wielded the spray can. She smiled and smoothed her brief playsuit.

Roberts winced and revised his estimate of the anarchists downward as she spoke:

"We don't have to be enemies," she said. "We could be a *lot* more friendly."

He tried to sit up, and discovered he was in a kind of straitjacket, though now his legs were free. He glanced at the girl.

"Now where are we?"

"Home. You've been examined by our experts, given nourishment, psychologically tested, and now the Veep is going to talk to you."

"Who—"

"The colonel-general's eldest son. He is in charge of the Movement in the absence of Colonel-General Pulgor himself. You see, the colonel-general is Presiding Officer of the Movement."

She rolled the titles reverently off her tongue as Roberts bit back sarcastic comments and noted that the feeling of weakness seemed to be gone, while his headache had died down to a hammering throb with occasional blinding sensations as if his head were being split open down the middle. This seemed, by comparison with what had gone before, almost good health, just as being in a straitjacket with his legs unbound seemed almost like freedom. Before he could congratulate himself on any of this, a massive paneled door swung open, to let in a tall, bent individual who looked to be in his mid-thirties, and who spoke in a whining voice:

"Damn it, Marty, I never get a chance to do what I want. If the old man wants to run this damn show, let him run it. I don't give a good—"

"Now, Mr. Vice-President, you know that His Excellency is imprisoned. That's the whole point of all this. To get him out of prison. You know that."

"And then what? He'll yell at me! He'll tramp up and down the room and scream and holler and demand what I'm doing with my life and why I don't care two—"

"Sir, please—"

"He'll say I'm supposed to give my

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life for the Cause, and how he's devoted his all to the Movement, and, damn it, Marty, the damned Movement is supposed to make everybody free, but you tell me, am I free? Heh? Am I? All those people got blown up, and now we've got the Space Force, and the Interstellar Patrol, and God knows what else after us—I mean, it's personal now! Don't you see what I mean?"

"Sir, permit me to introduce Lieutenant-General Vaughan Nathan Roberts of the Interstellar Patrol. General Roberts, you are in the presence of the son of His Excellency, Colonel-General Ian Pulgor, Presiding Officer of the Movement for the Creation of Universal Freedom In Anarchy. Gentlemen, time is limited. Permit me to urge that we waste no effort to arrive at a mutual understanding as soon as possible."

Roberts, gaining the impression that he was among lunatics, while himself trying to loosen the straitjacket, now became aware of a faint hissing sound that intensified any time he turned so that the right side of his head was toward either the vice-president or his companion. Roberts glanced around, and said absently, "Just Captain Roberts. I'm not a general."

The tall vice-president of the Movement laughed. "It's all right. Nobody speaks the truth around here. We're all free to lie however we choose. Even our own names aren't true. They're picked to conceal our identity, not state it. That's just another part of anarchy. But the rest of what he said, aside from all the lies, is true. We'd better get down to cases pretty fast. You're in trouble."

Roberts said seriously, "I'm listening."

"We've delivered an ultimatum, stating that the captives are being killed, one at a time. Each day, we 'kill' another, giving his name and a personal description. We get that from the internal security documents we captured on Tiamaz. The Transspace operatives had files on all kinds of things. It looks to us as if they had in mind the kind of scam we were planning ourselves."

Roberts noted the way this statement somehow slid from a threat to a delivery of information. He glanced around, to note the various expressions.

The "Veep" looked glazed, and faintly puzzled.

His companion, Marty, looked glazed and thoroughly confused.

Ginette was watching Roberts in puzzlement, and smiled as he looked at her.

Roberts, as he turned his head, was conscious of a succession of faint hissings, and a damp cold sensation in his right ear. He looked at the tall fretful Veep.

"What do you gain by claiming that you're killing men who have already died?"

"What do we get from it? Well, we get the direct personal enmity of the IP. I get nightmares. My buddies on the Governing Council get a sense of power. That doesn't help me any, but what can I do? I've got one vote on the Council, and I get outvoted every time. But never mind that. Now, we've got twenty-nine names to go through, and then we arrive at you. Your name is last on the list. I'm telling you, you'd better take that fact seriously. Just about every male member of this outfit except me is a homicidal maniac. They aren't stupid; they're vicious."

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"What do you want me to do?"

"Cooperate. Tell Ginette here—that's not her real name, by the way—everything you know about the Patrol. Everything. All our members will be delighted if you and she really get along in a personal way, because they'll think it's a real joke to see a member of the IP on the film that will be made up from the hidden cameras around the room. But they won't insist on that. All they want is the information. Everything else is irrelevant, if you know what I mean. What counts is that you spit out your guts and tell everything—everything—everything that you know about the IP. Don't hold anything back. Your life depends on it. Believe me, there's a body blow to the prestige and image of the IP with every death announcement, but that's nothing compared to what's coming. What they're going to do to you. If I could stop it, I'd stop it. I'd just kill you, not do what they're going to do. But I've only got one vote. What they're going to do to you will scare everyone else into line, believe me. We're going to leave now, but Ginette will stay here. With you. You two will be all alone together here. You can do anything you want. But before we go, I just want to say one more thing. OK, Marty?"

Roberts glanced at the second man, who still looked as glazed as the vice-president, and who shook his head, then shrugged. "Go on. After all, you're the Veep."

"OK, it's my judgment. I believe in being honest. Why not tell him?"

Marty looked as if he were trying to think, but couldn't find the controls.

"I said OK."

"All right."

"Then go ahead and *tell* him. Whatever."

The girl, looking at the same time puzzled and anxious, spoke up: "Marty—look—he's tensing and relaxing different muscles. I've been watching him. I think he's getting ready to try something."

"I noticed it. He can't do much in that jacket."

Roberts, who had been trying to calculate the odds if he did try something, said candidly, "What I'm trying to do is loosen the thing up a little. What were you going to say?"

The vice-president cleared his throat.

"I have to tell you, your lack of consciousness, both here and on the planet Anarchy, was not natural. We have some very capable medical people working for us. You have undergone a most thorough physical examination. We know the Interstellar Patrol is a scientifically formidable opponent, and we have been taking no chances. As a result of our examination, we have removed from the soles of your feet two closely adhering containers made of a fleshlike substance, containing picks to be used on locks. From the roof of your mouth, we have removed a similar substance in appropriate pink color, containing a small very thin sharp blade and a loop of fine wire. From your intestinal tract we have extracted a series of capsules containing light weapon components that might be assembled. Even your body cavities have been examined. Your clothing has of course been searched, and found to contain a really incredible number of deceptive arrangements and devices. The belt buckle, the

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belt, the wire woven into the trouser weave, the boots—everything has been checked, and just in case we've somehow missed something, we aren't returning anything to you."

Roberts nodded moodily. He thought he could survive the disappointment.

The vice-president continued. "Your equipment, clothing, and your body itself have all been thoroughly examined. We have left nothing to chance. It is obvious that you expected to be able to produce an arsenal at will. But there is nothing left." He looked at Roberts with a glint of satisfaction and said, "I'm sorry." He noted Roberts's expression, glanced at Ginette, and looked back at Roberts. "Your fate really is in the soft caring hands of that lovely girl there." He added earnestly, "I hope you can find it in you to show the courage to recognize facts, and I sincerely hope you reach a satisfactory accommodation. The two of you."

Roberts drew a breath to speak, and the vice-president, with an air of having just remembered something, said, "Oh, yes, there was something else. We also examined your teeth, removed the old-fashioned fillings in some of them, and replaced them afterward, having removed the miniaturized circuits embedded in the fillings. It would be nice to know just what *they* were. You can tell Ginette." He nodded and left. His companion studied Roberts's face, smiled like a shark, and went out, closing the door behind him.

Ginette looked at Roberts, and raised her eyebrows. She reached behind her, and held up the pressure can. Her voice was soft and pleasant:

"The Lady or the Tiger?"

Roberts winced at the sight of the can, and shook his head.

"Why bother to *ask* me to answer? The obvious thing is to put the questions under hypnotic drugs."

"As you well know, that's been done. Every answer was silly. At one point you said you were really a fusion bomb which would go off as soon as you reached a vulnerable spot in our arrangements. Another time you said that you were being shadowed by an IP dreadnought in kappa space, and that this dreadnought would materialize out of kappa space in seventeen point four seconds. Seventeen seconds later you laughed and said you hadn't started to count yet. This happened under a combination of hypnotic drugs that is supposed to make any lack of cooperation totally impossible." She looked at him uneasily, and shivered. "It really shook the experts. You didn't make any friends during the questioning, I'll tell you. You should have been a good boy."

"What did they do beside question me?"

"Oh, the doctors examined you, and said you'd had a course of immunization treatments they couldn't truly understand. You seemed to have been immunized against all kinds of sicknesses. There were things in your blood stream they didn't remotely begin to understand."

"Anything else?"

"Well, there were—ah—there were several interruptions, and it sort of threw things off schedule a little bit."

Roberts looked at her. "Interruptions?"

She said nervously, "The inspector-

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general of the Movement had just got back from Anarchy, and he wasn't in a very sweet mood. He and one of the doctors had sort of a little disagreement. After they'd got the inspector-general bandaged up, and gotten the bullet out of the doctor, they went back to work on you, only somehow there were a lot of tiny insects in the room—so small you could hardly see them—and every time the doctors would try to do anything, they would bite, and the doctors accused the nurses of leaving the windows open, and the nurses said some pretty bad things to the doctors, and the inspector-general threw such a fit that some of his stitches came out, and in the middle of this, the patient—that is, *you—said in a loud voice that if anarchy* was what we were aiming at, we'd achieved it, and how did we like it?—Don't you remember any of this?''

Roberts said regretfully, ''I missed it. I suppose it was the drugs. Where did all this take place?''

''Right here in the Citadel—Well, not in this room, but in the interrogation room, upstairs.''

''Are we at the headquarters of the Movement?''

''No, the colonel-general himself is the real Headquarters. But most of the rest of us are here now. This is our safest place—our citadel. I guess it can't do any harm to tell you now.''

''What happened then?''

''The inspector-general said something like, 'Get that bastard out of here before I kill him,' and the doctors went through their checklist and decided they had done everything to you they had to do, so they brought you down here, put you in a straitjacket, and the Veep said, 'I told you it would be a mess to take on the IP. We've had more trouble since we caught him than we've had in the last five years,' and Marty said, 'But where did all these damned tiny bugs come from? Don't we have any bug killer?' and someone by accident picked up the pain spray and used it, and got Sully and the Veep with it, and when we'd recovered from that, Marty got me off in a corner and said, 'Look, Ginette, somehow this SOB is more trouble doped unconscious than the whole twenty-seven of them on Tiamaz. What's it going to be like when he comes to? You've got to make the ultimate sacrifice for the Movement and at least keep him distracted.' And the Veep overheard the last of this and he nodded and said to me that they'd used science and it hadn't worked worth a damn, so it was all up to me now—and we all went to sleep for what was left of the night, and you know the rest.''

Roberts, who thought he finally understood what was going on, said, ''If we're supposed to be friends, what's the point of the straitjacket?''

''I can let you out of it, but first I have to be sure you're not going to make trouble. So far, I'm not sure.''

''Were you there on Tiamaz?''

She hesitated, then nodded. ''I don't know why I should tell you, but why not?''

''After all,'' said Roberts, ''if we're friends—''

She looked at him with no great conviction, and shrugged. ''Yes, I was there. It was awful.''

Roberts said, ''Shouldn't there have been at least some survivors?''

''IP survivors?''

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"Yes."

She shook her head. "The only man in this outfit who doesn't hammer on his chest all the time is the Veep. He spends *his* time whining and complaining. The rest are all so macho it would make you sick. Sully—he's the one on the tug—it sounded as if he was being frank, but in fact he covered up just how awful it really was."

"He said it was a shambles. It was worse than that?"

She nodded. "The takeover from Transspace was going all right until we ran into the Space Force and the IP—that was just as he said. But the unarmed Space Force men more than held their own when they protected the two girl operatives, and then when the IP got in it, it was horrible. Sully made it sound as if he took a cold look at the situation and decided to salvage what he could. In fact, we were run off the planet, and the only thing that saved us was the explosion, and he doesn't have any idea what made that."

"You're saying—"

"I'm saying the IP ship was probably fully manned. There weren't any survivors spread around through the casinos and fun houses. When the IP man with the Space Force saw what was happening, he called for help. So did Sully. We had the internal security set-up, but the IP got there faster. Our men were armed to the teeth. When Sully and his boys let loose, it sounded like the end of the universe. I don't know how many people got killed by accident with the shots that missed. But every time the IP shot, somebody on our side went down. The IP ship, held at the spaceport, blasted loose and got there before we could get away. If you ask me, the IP men got on their ship. That's where they belonged, so that's where they were. There were no IP survivors because when the ship went up, they all got caught in the explosion."

"And you don't have any idea what caused that?"

She shook her head. "Sully and the others think it was some kind of illegal explosives factory. But he doesn't know."

"You don't sound to me as if you hate the Interstellar Patrol."

She smiled wistfully. "A girl likes a man who can do things."

Roberts reminded himself how enthusiasically she had wielded the can of pain spray, then said, "It's a shame you're on the wrong side."

She shook her head. "No, you're on the wrong side. Your side will lose this one. Because, even though Sully got beat by the IP, and he'll get beat every time he comes out in the open and fights the IP, Sully isn't stupid. He's crafty. Every one of these macho swaggerers is an underhanded sneak, and the Patrol will never know what hit it. Even the Veep is crafty. And for pure slick cunning cleverness, no-one beats the colonel-general."

"He's in prison."

"Sure he's in prison. That's where he recruits."

Roberts looked at her.

She laughed. "You see, you don't know how to beat cleverness. What's wrong with the Movement is, it's macho. But after what the Patrol did to us on Tiamaz, it will be a long time before Sully and the boys come out in the open and fight again. They'll boast and brag

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and swagger, but when it comes right down to it, from now on, they'll stick to dirty tricks, clever ploys, lies, stabs in the back, bushwhacking—all the things they're good at."

"If the colonel-general is in prison to recruit, why can't he get out?"

She shook her head. "Of course he can get out."

"Then why does a captive have to be traded for him?"

"That's to embarrass the IP. We know they can't get him out without making a lot of trouble and losing their reputation. So that's why we demand it."

Roberts looked totally blank. She looked at his expression, and smiled. "*You don't understand, do you?* We make the demand that will make you go against your own standards, and that will turn you and the other authorities against each other. No matter how that turns out, we can't lose." She added, "You're cute when you're confused."

Roberts reminded himself that this was the same girl who had shown no hesitation to blast him with the pain spray. She, however, apparently interpreting his silence as embarrassment, came closer, watching his face and smiling. Roberts looked away, and jumped at a faint hissing sound before realizing it must be within his own ear.

"There, there," she said, smiling. "I won't bite you." She stood close beside him, bent, and gave him a kiss on the cheek.

Roberts remembered her aiming the pain spray and saying, "Another dose?" and he glanced around the room. "Are there really cameras all over in here?"

She nodded. "There are. And even if there weren't, the doors are handy to peep through. The Veep is good at telling you something that's true—and because you know he's a liar, you don't believe the truth he tells you." She looked at him, still smiling. "You're embarrassed, aren't you? Because of the cameras?"

"Well," he said, groping for a suitably embarrassed answer, "there's no privacy, no—"

"Here," she said, giggling, and suddenly undid the straps of the straitjacket that bound him, slid it free, and said, "I knew you liked me."

A tiny voice spoke in Roberts's right ear:

"Roberts, get the seductress into bed *with you, and turn your head so this ear* is against her nostrils. Don't waste any time. All hell is going to break loose shortly."

Roberts, of two minds on this idea, recognized the urgency in the voice, and did as he was told.

"Oh," she said, and abruptly lay still, the triumphant smile still on her face.

The voice spoke urgently in his ear, "Roberts, lie flat, face-down, turn your head to your left, and pull the covers over your head." An instant later, there was a brief sense of pressure and a scraping in his external ear canal, and something landed beside him. He found a thin tube, the cap off one end, a little ointment coming out.

The voice was tiny but clear. "Rub it over your face, neck, and shoulders, but not your ears. Stay under the covers. Rub it on her face, neck, and shoulders. And keep well under the covers while you do it."

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Roberts busied himself with the ointment.

From the door of the room came a puzzled murmur.

The tiny voice in Roberts's ear said, "OK. Now listen closely. Arrange the covers to make a channel from the right side of your head to the room. Lie flat on your face. Whatever happens, don't move, even if you feel a severe pain."

Roberts did as he was told, and lay flat.

There was a rapid crawling sensation as of a half-dozen tiny clawed feet hastening through his ear, accompanied by a bristle brush that just fit the ear canal. Something landed lightly on the sheet beside him. There was a second sensation just like the first. Then there was a buzz, that diminished into the room. Then there was another of the same set of sensations, and another buzz. And another. And another.

Across the room, the door slammed back against the wall. A baffled angry voice shouted, "All right! On your feet!"

Roberts didn't move.

The air instantly filled with a menacing whining droning sound. The sensation of thrusting crawling dozens of hurrying claws in Roberts's ear continued, and he lay severely still as the yells and screams echoed around the room, then moved off into what must be a hallway outside, to dwindle into the distance and mingle with a volley of shots and new screams from other parts of the building.

The crawling sensations in his ear stopped. The buzzing droning sounds were gone.

The tiny voice said, "Move further away from the woman, Roberts. Very slowly . . . now, open your eyes slowly . . . Do you see any insects? Speak in a low voice and we can hear you."

"No," said Roberts.

"Good. Turn over carefully . . . Slowly . . . Any insects on the covers?"

"No."

"OK. Lie still, face up. Pull the covers over your face. Don't get impatient. Don't move."

Roberts pulled the covers over his face, and lay very still.

There was the feeling of a stiff hard wire forcing its way out his ear. It was a tight fit, and very stiff, and it felt for an instant as if it would tear his ear off from the sheer force of its passage. Then the pain died away.

There was a light small sound, as of a feather brushing the sheet beside him. Then the mattress was pressed down, as if a large heavy hand pushed down on it beside him. Something cold and hard scraped past him. There were metallic sliding clicking sounds, as of machined metal parts being fitted together to form a larger assemblage.

"Roberts, whatever happens next, don't move. One way or another, it should be over very fast."

Something heavy was in the bed, under the covers on the opposite side from the woman. The thing moved down next to his side, to his waist, and stopped. He could feel the mattress give under it as it moved. There was a faint hiss, a smell as of burnt wool, a flare of warmth against his side, a snap, a sizzle, a second sizzling noise, and a repetition so fast that for an instant the air seemed filled with hissing sizzling snapping

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noises, as if sparks and bolts of flame momentarily filled the space of the room.

From all sides came a crash of plaster, the thud, bang, and clatter of heavy mechanisms striking the floor. Something whistled past his head, there was a dull crash, and bits of plaster pattered on the covers.

The voice in his ear said, "OK, Roberts. Wait a minute." Whatever it was traveled further down in the bed, to pause by his calves and ankles. There was a fresh smell as of burnt wool, and silence.

The voice sounded pleased. "Now, the room you're in should be clear of ordinary surprises. But take a look on your right side. Move slowly."

Roberts, wearying of this, opened his eyes slowly, and at once growled, "Could you put a weapon through?"

The small voice said, "Stay right where you are."

Beside him was a neat precise six-inch round hole opening straight down for a clear drop of what looked like about eighty feet, to a grey deck where he could see figures moving around lathes, drills, and a flexible arm that swung precisely around a workpiece. Roberts's view was obstructed by a thick flexible black cable that was bent over the edge of the hole toward whatever was lying, heavy and cold, beside his right calf and ankle. From under the covers came a click and snap, and at nearly the same moment, a gauntleted hand appeared briefly down in the hole and hauled the cable, a metal connection on the end, down the hole and out of sight.

It occurred to Roberts that if he did what he was apparently expected to do, and stayed where he was, and if he survived whatever was coming next, he would need quite a lot of ingenuity to explain what he had done while the Patrol settled with the Pulgorites. He could hear the questions already, before he was even out of the place:

"Say, Captain, were you actually in the Pulgorite safehouse when the attack came through?"

"Well . . . yes."

"You were a prisoner?"

"That's right."

"A hostage?"

"Yeah."

"That must have been rough."

"Well—no complaint. I volunteered for it."

"Yeah? Gee. That took courage. Just where were you when the attack came in that got you out of there?"

"Ah—I was—well—you see—"

"Lieutenant Jones is telling everyone around that when *he* got there you were in bed with one of the anarchists. Is that right?"

He could, of course, be suffering from some form of paranoia to even think that anyone might say this, and of course there were a number of ways this conversation might go; but there was no way it could go that Roberts wanted to actually experience. He cautiously tensed one muscle after another, and while there was soreness, and a cramped sensation, he found nothing that seemed touchy or severely painful. He carefully began to ease himself out of bed. The massive object under the covers near the foot of the bed was incidentally in his way. He tried to get a foot over it, and the thing made a quiet

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ticking noise as it moved its gun-like snout projecting through a burned hole in the covers. What the thing looked and acted like was a standard small-size turret, which suggested he shouldn't have an attack from FIAM to worry about from that direction, except that, for some reason, the turret's power cable had been disconnected.

"Roberts," said the tiny, very clear voice in his ear, "try to steady the rim."

Roberts carefully turned on his side, and put a hand on either side of the hole.

From somewhere down the hallway outside came a scream, then a volley of muffled yells:

"Kill the bastard!"

"Look out! There's another one!"

"Get the thing, damn it! Get it!"

"That's it! Come on!"

The small voice said, "Don't move, Roberts."

There was the sound of running feet approaching up the hallway. Roberts thought of the turret, and stayed still.

Through the hole, Roberts could see, as he carefully lowered his head to try to get a wider angle of vision, a railed work platform to his right, where a man in an informal pale blue-grey Interstellar Patrol uniform raised one of a set of checkered black-and-yellow paddles, gesturing with the raised paddle toward his own left. There was a thump, and he winced, gesturing downward with the other paddle. He then moved both paddles urgently back toward himself.

Roberts put his head closer to the hole, and could see to his left, a little K-class patrol ship, with a kind of slender periscope mounted vertically aft the turret belt. A second glance showed him that the periscope was vertical only because the ship was tilted, to avoid the main upper turret interfering with the slender metal cylinder.

Whoever was in charge of the ship apparently had the problem of getting the periscope up through the other half of the hole Roberts was looking down through.

The shouts, screams, and shots faded from Roberts's awareness as he considered the problem. No doubt if he could see the inside of the ship, he would have a better chance to understand what was wrong—but, no problem, he thought —and moved his part of the hole to try to see if he could center it over the periscope.

The scene stayed the same, moving as he moved the hole, and it dawned on him that it was the *other* half of the hole he would have to move if he was going to do it that way, and the other half of the hole was doubtless clamped solidly in place. There was another thump, and a string of curses came up through the connection as Roberts asked himself what imbecile was responsible for this set-up. All that should have been necessary was to leave the ship in its rack, and just slide the other half of the pair of space-connectors over the periscope. Exasperated as he watched the ship *move backwards, forwards, and sideways* without getting close enough, he reached down through the hole toward the periscope, and a voice instantly shouted, "Now I see it!" The ship at once came closer, and Roberts yanked his arm back, and moved his head aside.

From somewhere close by in the hall came a scream:

"Die, damn you!"

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Roberts glanced toward the door of the room.

From beside Roberts's ankle came a brief low whine, then a sizzling snap, and the room lit up in a blinding white glare.

There was a brief humming twanging sound, followed by another blinding glare, and a crash like a lightning bolt striking thirty feet away.

At Roberts's elbow, a male voice said casually, "Here you go."

Roberts, temporarily blinded by the glare, tried to look around, saw nothing but afterimages, listened to the smash of falling plaster, smelled smoke, and banged his head on a steel-hard column that rose up out of the hole to tower above him like a periscope. As his vision recovered, he could vaguely make out grid-like geometric forms folding out of an opening in the side of the cylinder. An inverted cone swung slowly around, made a number of fine adjustments, then locked into place.

Somewhere amongst the crashes and yells, a voice seemed to be singing a song with the refrain, "Never ever volunteer," and Roberts didn't know if he was hearing the small voice inside his ear, someone on the other side of the space connection, one of the Pulgorites, or if it was all strictly in his imagination. Wherever it was, he agreed with it. He started to get up, and the clear tiny voice said sharply, "Stay where you are, Roberts! It's almost over!"

This comment bothered Roberts more than the mounting volume of sound, or the menacing whine that shot past his head from time to time.

From outside came a sound like thunder, that grew louder and louder, and then there was a fresh set of yells, from inside and, now, from outside.

Roberts's hand bumped something, he felt again at his side, and his fingers closed around the muzzle of a hand gun. At once, he remembered the words, "Here you go." The gun must have been pitched through just ahead of the periscope. He switched grips on the gun as someone yelled from the hallway.

He jumped out of bed, to hear the words, "The son of a bitch is still alive!" Able to at least see as if through a fog, Roberts fired at the doorway, fired again, the whole room lit up as the turret fired, and an instant later the window where Ginette had stood earlier smashed in, and three figures in camouflaged armor were in the room, and then more came pouring through behind them.

The colonel tossed across the latest issue of the news sheet. Roberts caught it, and read the circled item:

PUZZLE

—

MOVEMENT DISAPPEARS

The Freedom In Anarchy Movement, headed by jailed leader Colonel-General Ian Pulgor, seems to have vanished into thin air.

Reporters seeking information at the devastated news conference site on the planet called "Anarchy" left when no one showed up after a wait lasting for five days. There have been no recent announcements from FIAM.

The Anarchy Movement achieved notoriety recently with its raid on the planet Tiamaz, and its capture and reported execution of many members of the Interstellar Patrol. The Patrol

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has refused to comment on the abrupt disappearance of FIAM.

The attempts of reporters to connect this disappearance with terrific explosions on the planet Anarchy, with an abortive FIAM victory announcement, and with reports of screams, armored troops, and heavy gunfire at a suspected safehouse of the Movement, have all been inconclusive to date.

In short, no one seems to know what has happened. Colonel-General Pulgor, due to be released on parole, had stated that FIAM has merely gone underground. But his voluntary confession yesterday to a crime carrying a five-year prison sentence, and his lawyer's insistence that he spend the sentence in prison, cast some doubt on the colonel-general's assertion.

What has really happened to the Freedom In Anarchy Movement? No one who knows is saying.

Roberts handed back the paper. "According to what Ginette said, the colonel-general recruits while in prison."

"We doubt his latest recruits will show much enthusiasm, as things have turned out."

"Eventually, he'll be out again."

"Oh, not necessarily, Roberts. We've looked into his history, and there are quite a few more crimes he can confess to, in order to not get out."

"Where's Ginette?"

"Back on her home planet. There are those who'd say that was a severe punishment, but she was happy. She was, by the way, the only one of that crew who hadn't yet comitted a capital crime."

"If pain spray would kill—"

"Yes, she had a talent there that it was just as well not to develop."

"I have a few questions."

The colonel nodded. "I'm listening."

"Why didn't I have a better idea of what was going on?"

"At the beginning, we had no way to know how capable their doctors and interrogators might be. The less we told you, the less they could get out of you. Moreover, we knew you were resourceful, and would catch on by yourself, provided you lived long enough. One way to keep you alive was to not satisfy their curiosity."

"OK. Now, what happened? I was there. I saw part of it. I have theories. But, I'd like to *know*."

"You understand the working of the space-connector?"

"I saw what it does."

"Good enough. The smaller size was almost a custom fit for the external passage of your right ear. We pumped you full of counteractants for a variety of drugs, some of which we expected them to use, and some of which we planned to use ourselves, put together a holder for the other half of the connector pair, got a volunteer to have that connector fitted in his ear every time you were examined—"

"Why?"

"Because they very thoroughly examined you, and used a flexible explorer device to look up your nostrils, down your throat, and into your ears, amongst other places. If we hadn't had the other half of that connector in *someone's* ear, what would they have seen?"

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"This explorer device would have come out in your lab?"

"It would have come out the other half of the pair of space-connectors, in our lab. It would have been as disastrous as for a couple of Greek soldiers to have stuck their heads prematurely out of the Trojan Horse."

"I see. This way, they saw the inside of an ear, albeit a different ear."

"Exactly. Fortunately, they made the natural assumption that the inside belonged to the same person as the outside. When they weren't examining you, we felt free to put our half of the connector pair back in its mount, and spray hypnotic drugs or distractants, or pass through a particularly vicious type of tiny black fly, or bad tempered bees, or spray a kind of quasi-human pheromone, or push a tube of—"

Roberts looked blank. "Quasi what?"

The colonel looked faintly embarrassed. "We thought it prudent to moderate the girl's tendency to empty the can of pain spray into your face."

Roberts started to ask another question, then changed his mind.

The colonel went on, "Well, you know what happened. We sent a tube of special-purpose insect repellent through this little jump-point straight into their so-called citadel. We put through spy devices so small no one who doesn't know about them believes in the possibility of their existence. When the opportunity was offered, we could even aim a hypodermic gun through, and inject the thugs who were carrying you with a particularly nasty variety of planetary flu."

" 'Grakes?' "

"Right. Of course, it was important that no one actually see these things as they happened. If, near the end, they had seen the oversized bees emerge in large numbers from your ear, anyone who happened to get away would have had something to talk about. For that same reason, you had to be under some kind of cover when we put through one of the larger size of space-connectors, squeezed into a narrow elliptical shape. The first thing we fed through that was a device to change the opening to a more usable circular shape, and the second thing was a kind of modular small-size mobile fusion turret that detected and blew the spy devices in the room to bits, and guaranteed problems for anyone on the other side who tried to get at you."

"Why disconnect the power cable? To make room for the periscope?"

"Partly. Mainly because we had a better connection, through a pair of space connectors. We wanted to be certain that worked before disconnecting the cable. Next, we ran the specially fabricated periscope through, after a trifling little contretemps that could have wrecked the whole operation if you hadn't seen what to do."

"Getting the periscope through the hole."

"Right, Roberts."

"Why not slide the hole over the periscope?"

The colonel shook his head. "Well—I'm afraid my explanation of the nature of the device must have taken too much for granted. I warned that it couldn't be seen from the wrong side. The officer in charge concluded that it would be a lot safer if it were screwed down, and for some asinine reason he put the whole ship—well, you saw it.

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So then the captain of the ship had a shadowy hole in a grey rim to find against a grey background, and amongst the experimental junk on the ship, and the pipes overhead in the workshop, he almost didn't do it. Fortunately, you saw what to do."

Roberts, who had acted out of exasperation, on the thought of taking hold of the periscope to guide it to the opening—which overlooked the mass of the ship—kept his mouth shut, and the colonel went on, "Once the periscope had passed through into their stronghold, it, among other things, emitted a signal we picked up from outside, that enabled us to locate the place exactly. And that was that."

"Ginette was sure we were too dull to compete with their cunning minds. Sully was positive they were a lot sharper than we are."

"Which was all a big help to us." The colonel added innocently, "Of course, Roberts, they were judging our intelligence by their captive."

Roberts said ruefully. "A serious mistake on their part."

"It's hard to shine after you've been knocked over the head, put through surgery, and pumped full of two organizations' special drugs."

"Yes, but it was their framework of calculated lies that stunned me. Not a word of truth; but if they hadn't run into trouble, would anyone have known?"

Colonel Sanders nodded.

"They were clever, but on a basis not in line with the facts. When they spoke to you, their words came out in our laboratory. When they took you into their 'citadel,' they opened it up to our selection of small pests, and ultimately to anything the parts of which we could get in through a six-inch hole, including a device that could locate their position exactly. Springing dirty tricks on the suckers seems a lot more clever than research. But research can change the conditions to such an extent that, for the time being, at least, the clever swindlers can't even recognize the game. And quite a lot can happen before they figure out what went wrong—if they're still around to figure."

Roberts said thoughtfully, "To those on the receiving end, that must seem like quite a clever trick from such a bunch of gullible innocents."

The colonel smiled.

"That's true, Roberts. To someone who has a racket nicely adapted to present circumstances, research that unexpectedly changes the circumstances is in the ultimate class of mind-stopping underhanded knockout blows—right along with older versions like the Trojan Horse." ■

●They that can give up essential liberty to obtain a little temporary safety deserve neither liberty nor safety.

Benjamin Franklin

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the reference library

By Tom Easton

The Divide, Robert Charles Wilson, Foundation/Doubleday, $19.95 (hb), $8.95 (trade pb), 249 pp.
The Boat of a Million Years, Poul Anderson, TOR, $19.95, 544 pp.
Second Contact, Mike Resnick, TOR, $17.95, 288 pp.
Crescent in the Sky, Donald Moffitt, Ballantine/Del Rey, $3.95, ? pp.
A Short History of the Future, W. Warren Wagar, University of Chicago Press, $24.95, 323 + xiv pp.
Chekhov's Journey, Ian Watson, Carroll & Graf, $16.95, 183 pp.
Renegade, Cordell Scotten, Ace, $3.50, 150 pp.
Rationalizing Genius: Ideological Strategies in the Classic American Science Fiction Short Story, John Huntington, Rutgers University Press, $37.00 (hb), $15.00 (pb), 216 pp.

I didn't read Robert Charles Wilson's last book, *Gypsies*, though it drew some very good reviews elsewhere. It was in the stack, and I thought it likely that I would enjoy it since I had found his first two novels, *A Hidden Place* and *Memory Wire*, quite interesting. But there were so many other books awaiting my attention, and I kept picking up something else, and . . . Well, I just didn't get to it. It happens. Sometimes I fail to review a book because the publisher failed to send me a copy, or because I hated it. More often, I just don't get to it until it's too late.

When I've enjoyed the author in the past, neglecting one book makes me a bit more likely to pay quicker attention to his or her next. That's what happened here. **The Divide** landed on my doorstep, and I said to myself, "Don't let this one slide!"

And I'm glad I got to it. *The Divide* is a Charlie story, meaning that, like Daniel Keyes's *Flowers for Algernon*, it considers how it might feel to be made a superman, and then lose it. Wilson

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tells us that a less than perfectly scrupulous researcher, Max Kyriakides, funded by a secret government agency, injects a fetus with chemicals that stimulate the growth of certain portions of the brain. The result is John Shaw, a preternaturally intelligent child who, because his intelligence makes him a thorough misfit in the world, invents an alter ego, Benjamin, who can behave "normally" for him. Eventually, John "resigns," leaving life to Benjamin. This congenial but limited fellow, pruned of all those abilities that awaken fear in others, leads a reasonably successful life. Yet John does surface from time to time.

It sounds like a classic case of multiple personality, doesn't it? In fact (as I understand such things), this multiplication of personalities happens for much the same reasons as it does in psychiatric cases, with new personalities being created to handle what the central personality cannot. What is different is the underlying situation and the reason for the ultimate disintegration of the patient's *modus vivendi*. When Kyriakides lost his funding, he foisted John off on a foster family. But he continued to experiment with animals on his own, and he learned eventually that the induced brain growth was unstable. The body seemed to reject it as if it were a transplanted organ. The result: death, or at least the loss of all the mental enhancements the brain growth permitted. Kyriakides believes that something similar must happen to John.

He therefore sends his assistant, Susan Christopher, to try to persuade John to come back to the lab for study and—supposedly—help. She travels to Toronto, meets John (as John), and falls for him, sensing in him a soul as lost as her own. She also meets Amelie, the woman with whom John (as Benjamin) is living, and Roch, Amelie's psychopathic brother.

John refuses to bow to Kyriakides's demands, even though he has already sensed some signs of impending breakdown. Benjamin is more willing. John flees. Roch moves in on Amelie. John returns, finally willing to cooperate, even if in no more than satisfying Kyriakides's curiosity, partly because he finds himself returning Susan's affection. John and Susan rescue Amelie from Roch. The barriers between John and Benjamin weaken day by day, and we see the two personalities inching toward a merger. Roch kidnaps Amelie. John, on the verge of collapse, must go to the rescue. And then . . .

The Divide is not *Flowers for Algernon*. Keyes focused on Charlie, his transition from subnormal to supernormal, and then the crashing loss of everything. No happy ending there. Wilson sees a Charlie who, as a child, rejected supernormality in favor of normality, of fitting in, and now faces the loss of all. The focus is less on John Shaw himself, however, than on those around him, and John does not in fact lose everything. There is a reconciliation, a unification of parts, and the ending—full of action and villainy and heroism—is a happy one.

The Divide is thus a more conventional, less striking tale. Yet saying that is not to denigrate Wilson or his work. Wilson is an excellent writer, and his tale is quite well told. In short, if you buy this one, you won't be wasting your money.

A number of renowned SF writers have, in their later years, chosen to link all the tales they ever wrote, either by creating a connecting thread to tie everything into a single future history or by calling all the tales alternate vi-

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sions or worlds and creating a bridge to let them mingle.

For a third approach to building a capstone for a career,[1] here's one I like rather better. It's the approach Poul Anderson takes in **The Boat of a Million Years**. Very briefly, it is as if he said to himself, "Let's see . . . I've written about all these ages of the world, in all these styles, about all these types of characters. Men and women, whores and merchants, leaders and followers. Romans and robots. Oxcarts and spaceships. Fantasies and historicals and science fiction. I wonder . . . can I find a way to use it all? Not repeating myself, no. A new story, something that needs all I have ever learned to do, something that unifies all the many things I have been concerned with over the years."

The result is an astonishing display of virtuosity, of which one segment, "The Comrade," appeared in *Analog* in June 1988. Anderson posits that very, very occasionally an immortal is born. Meet Hanno the Phoenician, Rufus the Gaul, Deathless the Amerindian shaman, Aliyat of Syria, Svoboda of the steppes, others. Each draws attention by failing to age and must, to survive, cut and run, time and again, losing homes, loves, wealths. Endlessly, they must adapt and cope in whatever ways they can, though they may find professional niches—prostitute, bureaucrat—that permit both stability and relative invisibility. Yet they are lonely, and they yearn for others like themselves. Occasionally, they meet. Sometimes those meetings produce enduring partnerships. More often, there is a failure of trust, betrayal, flight.

The tale begins in Phoenician times. Thereafter it skips from era to era, portraying the dilemma of the immortals while giving Anderson the chance to show us how well he can give us, in the styles he commands, the taste of the Norseland, China, Japan, Syria, Russia, Turkey, the American West. If the momentum builds slowly, that is in large part due to the nature of the tale and its inevitable structure. As the cast lines up before us and the storyline nears familiar times, the pace accelerates and we grow involved. In due time, Hanno, eldest, funds immortality research, the immortals come together, and some reveal themselves. Immortality for all humanity quickly follows, though the event itself is lost in one of the many broad cracks between the chunks of the tale, and the original immortals, now known as the Survivors, become irrelevant anachronisms, the last of humanity's children.

The final segment of the tale is a time of space travel, of listening posts that detect the conversations of distant sentients, of robot explorers, of Earthbound complacency, of a technology that permits Hanno and his friends to request a starship of their once-mortal fellows. They get it, they go forth, and they find . . .

I will say only that Anderson suggests that the pattern he portrays for human history may be nothing unique. It may, indeed, be common, and those who explore the galaxy in their immortal flesh, and not via the surrogacies of robots, may be as much irrelevant misfits as Hanno and his buddies.

Don't miss.

Mike Resnick rides at least two steeds to his writing. On one, he gives us serious, thoughtful commentary disguised as story; examples are the recent *Par-*

[1] "Capstone" sounds like something that must mark the end of a career, not just its heights. Let's remain open to the possibilities of the future and make that end or heights *so far*.

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adise and *Ivory*. Riding the other steed, he produces pure story, if you will, without the pot of message; the result is light, even slight, as in *Stalking the Unicorn*, and it doesn't please me as well as his more serious work.

Can you see it coming? Yes, he's done it again. He's written another pure entertainment. As you should expect by now, it's deft, clever, a real fast good read. Resnick knows what he's doing, and he does it well. But this one does not seem to have as much meat beneath the surface as I like to find.

Or so I thought when I first began to reflect on his latest, **Second Contact**. But then I began to see. . . .

First contact: Some twenty years before the story, an Earth starship met an alien ship near a distant star, and the two blew each other into dust. Second contact: A military lawyer is assigned to play defense in the court martial of a mad starship commander who wasted two crewmen because he "knew" they were aliens in disguise. Max Becker, the lawyer, takes his work seriously, and when Commander Jennings insists on being defended on his own terms, Becker sets out to find all those people who might possibly testify that there was anything strange about the putative aliens. Unfortunately, as quickly as Jennings feeds him names, the space service spirits them off to distant parts from which they may not be recalled. Finally, with the aid of Jaimie, a female ace computer hacker, he finds one available possibility, locked in a military hospital ward. Jaimie educates him in the sweet art of connivery, he talks to Montoya, learns that the deep dark secret involves drugs, and . . . No, he doesn't lay off. He gets suspicious. He lets his suspicion show. The space service sends assassins after him. And the big mystery is WHY? Finding the answer occupies Becker, Jaimie, and Resnick through the bulk of the book, and the reader quite happily tumbles along in their wake.

The meat lies in Resnick's use of Becker's outrage at the coldness of official scheming to drive the plot. Government agencies, says Resnick, too easily view human lives as disposable and order murder for the flimsiest of reasons—secrecy, convenience, embarrassment. What matters is the individual human spirit. The only hope of moderating official callousness is to enlist individual spirits in its service. The hazard of civilization is that those spirits too easily grow callous in their turn.

Enjoy.

The Moslems are coming. It's true. In England, France, and many other countries, Islam is becoming a powerful force as its adherents increase their numbers by immigration and reproduction. At the same time, the dependence of modern civilization on fossil fuels, specifically petroleum, is swelling the coffers of many traditionally Moslem nations, and those nations are investing heavily in Europe and North America. It is therefore not at all unreasonable to project a future in which Islam rules all of humanity, even more thoroughly than Christianity did at its peak.

This is, in fact, precisely the future Donald Moffitt projects in **Crescent in the Sky**, the first volume of his latest diptych, *The Mechanical Sky*, which will be concluded by *A Gathering of Stars*. Christians, Jews, all others, are persecuted minorities. The rulers of Earth, Mars, the Centauri worlds, and more are emirs, imams, mullahs, and ayatollahs. Women wear the veil. Men bow to Mecca[2] when they pray, five

[2] Yes, it does indeed get tricky, figuring out Mecca's direction when you're on Mars.

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times a day, on schedule, even when it means interrupting tricky procedures such as those involved in the genetic engineering of new race horses for the Emir of Mars, a Mars that has been equipped with desert-roaming bedouin on genetically engineered camels, among other things straight out of the tales of Lawrence of Arabia and Scheherezade.

The technician who thus botches his work is Abdul Hamid-Jones, an innocent through whose eyes we get to see all that can possibly be wrong with a religious tyranny. Luckily, he survives his gaffe. The Emir is a blood-thirsty tyrant who has kept his throne for centuries by periodically having his head sewn onto a freshly cloned body. Now he wishes to qualify to become the head cheese of all the human worlds, the Caliph, by taking a new body on the journey to Mecca. Accordingly, he has just announced that he will be beheaded once more. Abdul is invited to be a witness, apparently because his boss, the Clonemaster, is grooming him for higher things. Dignitaries arrive in such vehicles as *khad al-lakhs*. And terrorist assassins, apparently working for the heir to the Emir deposed by the present Emir's predecessor, blow hell out of the ceremony, the Emir, the clone body, the surgeons, Uncle Tom Cobbley, and all.

The government's response is a massive purge. Abdul is promoted to replace the late Clonemaster. He is enlisted by the Vizier, threatened by the head of the palace eunuchs, and approached by Centauri agents. And when a cloned dummy is presented to the public as a fortunately surviving Emir, and the eunuchs overthrow the Vizier and the forces of moderation, he escapes the bloodbath by fleeing to the desert. Eventually, after a fair ration of adventure, he meets the Centauris again and learns that not all of Islam is as rabidly destructive as Mars. In the next volume, he will apparently see the alternatives, and perhaps he will play a part in the effort to create an interstellar utopia.

Moffitt's conversion of Mars into a red Sahara feels quite anachronistic. Yet, thanks to the use of genetic engineering, it seems almost reasonable, and certainly more believable than the Mars of many another yarn. We can accept it for the sake of the point he seems to be making. It also allows a grand, satiric romp through the bloodier excesses of the Arabian Nights. If there is a problem, it is that the satiric details and the more serious thrust of the tale do not seem to be entirely comfortable together, as if Moffitt was not quite sure what he wanted the story to be.

Made-up histories of the future are not at all uncommon in SF. We even have a "future history" subgenre, and at least sketchy future histories are essential background to almost any tale set in the future. Occasionally a writer tries to paint the future in broad strokes, without benefit of plot, and we have a Wells (*The Shape of Things to Come*), a Stapledon (*Last and First Men*), a Resnick (*Birthright: The Book of Man*), and others. Now we can add W. Warren Wagar to the list with his **A Short History of the Future**, which takes us into the utopian time of the twenty-second century.

Wagar states at the beginning that his is a Marxist view of history. Capital(ism) is the root of all social evil, and in the near future it will come to dominate all the world, even behind the Iron Curtain, with an exceedingly heavy hand. Near the middle of the next century, however, all will collapse and the socialists will take over the world and do away with income inequity while guaranteeing that everyone has equal opportunity. One

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way this works out is to bar artists (such as writers) from public exposure (as by publishing novels) more often than once a decade; since income is guaranteed, they don't need to make a living from their art; more frequent exposure is only bourgeois egoboo; and others (regardless of their talent or lack thereof) need a chance, too.

Unlike some Marxists, Wagar recognizes that such a utopia will not suit everyone. Come the twenty-second century, the socialists give way to the Smalls (modeled on E. F. Schumacher's *Small Is Beautiful*), everybody can do their own thing, free of large-scale government control, and the millennium is come. To make it work, Wagar posits that there will have to be some redesign of the human genome to make us more cooperative and altruistic, as well as more intelligent, and he gives us the technology to make each community independent of imports. He thus offers us a utopian dream of the 1960s tempered by a bit of realism.

Wagar's vision is delightfully thorough and intricate. He has covered an astonishing number of bases in his attempt to imagine how the future may work out, and I found his book fascinating. Yet part of my fascination sprang from what I imagined must be the author's intense frustration with reality: I was reading in November 1989, when the West won the Cold War as decisively and peacefully as anyone could possibly imagine. Communism —Marxism —was disintegrating in the face of jeering crowds. The Berlin Wall was coming down. Czechoslovakia, Poland, Hungary, all but Albania (so far), were racing pell-mell toward democracy. Wagar might say that the crowds were racing toward capital and prosperity, but the news accounts made them seem far more interested in getting the Marxist monkey off their backs. They wanted freedom, self-determination—actually, the heaven Wagar offers for two centuries hence. Prosperity just wasn't the point, though it would be nice, and they had every intention of shooting for it as soon as they got the tyrants out of the way.

Pity the poor author. Even as his book is published, the world is changing in such a way as to make it seem irrelevant, outdated, and even quaint.

Ian Watson's **Chekhov's Journey**, first published in England in 1983, is now available in this country, and I recommend it to you as an intriguing piece of entertainment. It begins as a Soviet film producer and a screenwriter get together with Mikhail, an Anton Chekhov look-alike, and a hypnotist with a technical gimmick. The idea is to hypnotize Mikhail and have him relive Chekhov's 1890 journey to Siberia in order to generate a film script. At first, all goes well, but then Mikhail "relives" Chekhov's learning of a strange explosion in Tunguska.

You say you've heard of that big bang? And you'd swear its date was 1908? That's what Watson's characters think too, but Mikhail insists that he is living the—or *a*—truth, and then he picks up the life of a *future* doppelganger, the commander of a spaceship shaped like a hammer and sickle. The ship is about to begin a voyage back in time while staying still in space, the idea being that when it stops back-timing, the galaxy will be at an earlier point in its rotation and another world will be within reach. But something goes wrong. The ship stays near Earth, plummets toward the ground, and projections say it will strike in Tunguska. In 1908.

Meanwhile, Chekhov has acquired a crew of adventurers, including Kon-

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stantin Tsiolkovsky, and headed for Tunguska to check out the rumors. And in our time, Mikhail and his handlers are totally confused, not least because if they try to leave the rustic retreat in which they are working, they wind up back where they started—they seem to be trapped in an isolated bubble of time, a time storm.

Strange stuff. The kind of science fiction that makes your head feel funny. And fun.

Cordell Scotten's **Renegade** is the second volume in the "Robots and Aliens" extension of the *Isaac Asimov's Robot City* series. Derec and Ariel have discovered who they are and who interfered with their memories, built the Robot City robots, and planned the cities. Now, still hampered by holes in their memories, they are roaming the galaxy, helping the Robot Cities spread. Unfortunately, not all worlds are entirely passive in the face of the invasion. Oyster World has intelligent natives, solar-powered flyers called Ceremyons, who find the nascent city disturbs the weather and their flight patterns. The Ceremyons therefore start building over the city a dome that is somehow related to a black hole. Ariel, summoned by the robots, must find a compromise that will permit robots and Ceremyons to coexist peacefully. Eventually she must summon Derec, who arrives with a strange and possibly alien robot, the shape-changing SilverSide, that obeys the same three laws—protect humans, obey humans, protect self—as more familiar robots but does not know what a human is. Its efforts to figure out the mystery provide most of the conflict that drives the story.

Renegade has its points—much more awareness of the robotic world Asimov imagined, which supposedly provides the context for the series, mentions of Asimovian characters such as Han Fastolfe, nods to other literary roboticists such as Clifford Simak. Unfortunately, it shares the major fault of this series and most other examples of literary sharecropping (including shared-world anthologies): It is so criminally derivative that the author's name, and even the book's title, are less conspicuous on the cover than Asimov's name and the series title.

As Norman Spinrad has said elsewhere, literary sharecropping is a practice which, in the name of marketing, reduces the book to the level of sheer product and robs the author of whatever reputation and future earning power he or she might gain by writing his or her own story. Yes, it pays, and yes, writers have to pay the bills. But the publishing industry would operate with a better eye to its long-term prosperity if it promoted new "Big Names" instead of sucking the last juices from the field's elders.

Academics are constantly searching for new veins to mine. Usually, this seems to mean finding novels or authors (new or old) that no one has paid much attention to, or finding new ways of looking at or interpreting novels that have received plenty of attention. And yes, mostly it's novels that hold center stage, with short fiction getting a bow only to fill out the program.

Does that sound like short fiction might be one of those new veins? John Huntington thought so too. He therefore found a group of Golden Age shorts of certifiably classic status—no arguments about why he picked this story and not that one; the members of the Science Fiction Writers of America did the choosing for him—called it "the core set of popular SF texts," and focused his attention accordingly. The "core

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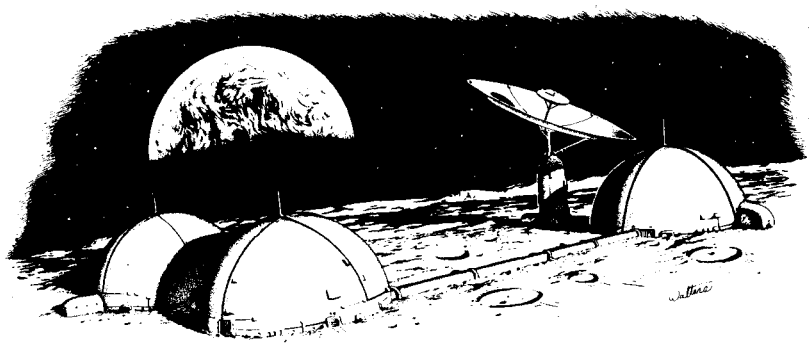
set'' is the *Science Fiction Hall of Fame*, volume 1, first published in 1970; it contained 26 stories by Weinbaum, Campbell, Asimov, Bester, Heinlein, Del Rey, Simak, Bradbury, Leiber, Blish, Clarke, Zelazny, Knight, Keyes, and more.

This is indeed a hard set to argue with. Certainly, the stories are among the cream of the period, and they probably are reasonably representative of the work being done at the time. It is thus quite interesting to see what Huntington makes of them in **Rationalizing Genius: Ideological Strategies in the Classic American Science Fiction Short Story**. The ideology he sees is technocracy, whose hero is the solitary genius (later, the ''man who can''). There are strong strains of sadism, racism, and—not mere sexism, nor even antifeminism, but a vicious anti-woman feeling, as exemplified in Godwin's ''The Cold Equations.''

Are you surprised? The field was young then, the writers were too, and the pulps were not terribly sophisticated. That sophistication came later, when ''the loss of narrative innocence leads to a self-reflectiveness that, for all its increased sophistication, is devoid of the explicitly utopian element that has up until now defined the form. The maturation, if you will, has taught the form how to be evasive, how to avoid embarassing itself.''

Interesting, as I said. Huntington may even be right, though you may think he strains a bit for some of his interpretations, or that he sees too many contradictions within the stories, or that he finds ambiguous what is crystal clear to you. You may even think he's full of prunes. But you're sure to agree that he's interesting.

The jacket copy put it this way: ''provocative analyses'' that ''should arouse considerable discussion.'' That is, for every reader who throws him a rose, another will throw a brick. ■



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brass tacks

Dear Dr. Schmidt:

I just finished Thomas A. Easton's "Sparrowhawk." Although it was a fair adventure yarn, I was unable to suspend my disbelief of the policeman, Bernie Fischer.

Mr. Easton's knowledge of police procedure is poor. Big-city police departments typically have written policies governing use of deadly force. A police officer may shoot only in response to a direct and immediate threat to his own life or the lives of others. The only sure way to get a murderous felon to quit is to kill him. To avoid endangering bystanders, the officer is expected to identify his target rather than indiscriminately blazing away. There is no shooting to wound, warning shots, or waving guns around; the situation either justifies deadly force or it does not.

Shooting the lock off a door is ridiculous. Apart from the fact that it wouldn't work on a metal door, it violates the rules. When Fischer served his arrest warrant, the suspect posed no immediate threat, so there was no justification for shooting him. Shooting at a closed door endangered the suspect, Fischer himself (richochet), and any innocent person (Fischer could not possibly have known there wasn't one) in the room.

A felony arrest warrant should always be served with at least one other officer present. Spectators should be cleared from the area. If the suspect barricades himself, and forced entry is required, the tool of choice is a sledge hammer. Its use will not endanger bystanders, and the officer need not stand in front of the door to use it.

The second blooper involves the performance of Fischer's .357 Magnum handgun. Sure, we've all seen Dirty Harry shoot through brick walls, but that's fiction. Police weapons and am-

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munition are designed for use against personnel. The most effective .357 Magnum loading is a 125 grain (8 gram) expanding bullet at a muzzle velocity of about 1,250 feet per second. It is designed to expand after shallow penetration, with enough residual energy to break the breastbone and cause massive internal trauma. Ideally, it won't shoot all the way through, because that might endanger bystanders.

I'll concede Fischer's ability to kill the modified sparrowhawk with this cartridge, although it would require a perfect shot. I'll even concede his amazing marksmanship. There are others who are that good, and that lucky; and anyway, this is fiction. The modified bulldog, as big and tough as a rhinoceros, is another matter.

The old Kenya Game Commission specified .375 H & H Magnum as the minimum acceptable rifle caliber for guest rhino hunters. That cartridge uses a solid bullet with 2½ times the mass, twice the velocity, and roughly nine times the energy of a .357 Magnum. It is designed to penetrate big bones and dense muscle to reach the animal's vital organs. A handgun bullet, designed for soft-skinned targets, would likely break up on impact. Even a good hit on the roof of the animal's mouth would probably penetrate no more than 9", not enough for a sure kill. Fischer's pistol would be most effective if he used bacon grease as a lubricant; then, when he threw the empty gun at the animal, it might stop to sniff and give him more time to run for his life.

These things are the equivalent of an orbiting spaceship performing an Immelmann turn. Worse, they're easy to check. For the first, call the public affairs office of the nearest urban police department. For the second, buy and read hunting-oriented magazines available on any supermarket magazine stand.

This isn't science, but it should be right anyway. Your readers expect and deserve it.

A. FRANKLIN BRAYMAN, III
Trussville, AL

Dear Dr. Schmidt

I have just finished reading Thomas Easton's *Sparrowhawk*. I, too, find the concept of biological engineering a fascinating one. For me, unfortunately, the novel was marred by inconsistencies and errors in the biology which would not be tolerated in an SF novel based on physics. This has long been one of my pet peeves with *Analog*.

In the first installment, the "gengineers" need to graft pockets on to their bioblimps for storage. This is accomplished by grafting the gene [sic] for a kangaroo's pouch into the jellyfish. We know that Easton realizes that *phenotypic* effects (i.e., the external result of the action of genes) are the product of families of genes, each contributing either control of processes, such as the timing of events during the development of an embryo, or as individual proteins, including hormones and other controlling substances (he says so in the second installment). The kangaroo's pouch is the end result of numerous developmental timing events affecting many different tissues: epithelial, blood vessel, nerve, etc. Yet we are told that transplanting a single gene into a medusa (the free-swimming form of a jellyfish) will produce the same result. This, despite the fact that a jellyfish has such a dramatically different embryological and evolutionary history from the mammalian kangaroo.

This is like Larry Niven basing a story on creating a superconductor by squeezing layers of Playdough and Silly Putty

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together. You can build a story around this, but it is not a reasonable extrapolation from what we know. In fact it is contradictory, which is not the same as using a clever loophole or alternate theory to provide yourself with an FTL drive or other SF convenience.

I also found the use of giant birds for air transport hard to take. Easton does not fully deal with the problems of allometry, or scale. As is well known, the size of an animal may increase arithmetically, but its volume increases by the cube. So even though he mentions metal bone reinforcement being necessary in larger specimens and that they are fed a more energetically concentrated meat diet, there is no real allowance for the problems of providing a flying animal of such size with enough energy, oxygen, and blood flow to allow it to live, let alone fly. Today, it is generally thought that a condor is about as big as a flying bird can get. It is not clear that birds as large as those in the novel could even extend their wings. There are limits to the stress that bones can withstand and the force muscles can exert. A brontosaurus is in some ways a scaled up elephant, but it problably needed water to help support its vast bulk, simply because its legs probably could not support the load.

There are also engineering problems which I would be interested to see addressed. A bird is well designed for what it does, which is flight at relatively low speeds. Even with jet assist, could they fly at airliner speeds with safety and economy? Aircraft get around these problems by being designed for efficient high speed flight and then having various devices such as flaps and slots added, which increase weight and cost, so that they can fly safely at low speeds. As any pilot can tell you, though, pushing past their "redline" or "never exceed" (V_{NE}) speed is very dangerous. Granted that birds are much more versatile flying machines than airplanes are, we also have to remember that they don't carry their passengers internally like the tortoise and insect ground "vehicles" of the novel. Instead controls, passengers, fuel, and engines are strapped on in pods. These seem, from the descriptions, to be aerodynamically inefficient and to suffer from the obvious safety weakness that becomes an important part of the story—the straps that hold them on (which could fail either at their attachment points or in the strap material itself). Finally, since metal is recyclable and old aircraft are constantly being scrapped, I don't see that engineered birds would necessarily have an economic or environmental advantage, since they also require engines presumably powered by fossil fuels.

Let me conclude by saying that I enjoyed the novel and found it to be thought-provoking. The possibilities of future use of our increasing knowledge of genetics and biology in general have not yet been adequately explored by SF writers. The level of complexity of biological systems is high, making it slow going in understanding them fully, but this also promises a potential which may exceed any other technology being explored by humans. I think, though, that our current vision will prove to have been unable to predict the subtle and far-reaching consequences of this technology.

MARK FAGAN

Toronto, Ontario

The author replies. . . .

Dear Mr. Fagan:

I am delighted to hear that you enjoyed *Sparrowhawk*. It will be out next fall from Ace, and you will find it about 10% longer, with some of the gain in explanations.

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I am fully aware of how much in the way of justification (pleiotropy, allotropy, energetics, etc.) is either merely hinted at or entirely skipped. Is any of my "organic future" impossible by nature of the biology? I'm reluctant to say so. Is it any more impossible than the time machines, ftl spaceships, and pocket particle-beam projectors (blasters) we see so routinely in physics-based SF? I offer you a flat no on that, and you may take that as meaning I am an insane biotechnological optimist or that I think the phrase applies to many of the physics-based writers. I think the basic difference between my "organic future" tales and physics-based SF is that the latter gains acceptability by its familiarity. But then, I was trying to come up with a new and different way to provoke that old-time sense of gosh-wow wonder.

Then again, wait till you see the next novel!

THOMAS A. EASTON

Dear Dr. Schmidt:

This relates to your Oct. '89 editorial ("The Limits of Tolerance"), and is also to affirm your prior editorials dealing with narrow views of complex subjects.

I am an engineer and "computer expert" with 40 years of professional association with the high-tech aspects of national defense. It occurs to me that some of the problems which you have dealt with editorially derive from the tendency to be insufficiently humble about what we think we "know."

Expansion of technology (engineered applications of fundamental scientific knowledge) tends to give us the impression that we know more and more, and that the power implicit in that is taking us over. Certainly technological applications are giving us more power and the opportunity to be preoccupied with or misuse it. But this must not be confused with an absolute expansion of knowledge. Much of what we are learning (a) corrects prior things we "knew" that were not true, or not true in as general a way as we thought; or (b) opens up new vistas of unforeseen ignorance. Thus, as we learn, we discover that the universe of knowledge is larger than we had previously perceived it to be.

One of the things I learn from this is that I should not be so arrogantly certain that what we "know" is absolute and universally applicable "*truth*." I maintain and value a "learning stance" in life, and this perhaps affects my attitude toward tolerance. My understanding of my "religious" beliefs precludes the personal use of power in any form to force others to conform to my belief system. Rather it enjoins me to model my belief system in my own behavior. You may find the results attractive, and if so you may ask how that comes to be; in that case I will explain it as best I can. Meanwhile, I am also enjoined to listen carefully to you (and observe your behavior and its results), because it is possible that I can learn from you.

I believe this embodies "tolerance" as your editorial defined it, possibly with more positive overtones, and presents a view counter to what I perceived in that piece: that "religion" *necessarily* tends to intolerance. There are intolerant religions, to be sure—or at least intolerant practitioners thereof. But some religions are careful to distinguish between unacceptable behavior and the persons exhibiting that behavior, who are, the behavior notwithstanding, as sacred as we are.

What I do when your "arm-swinging" impacts with my "nose" is another problem. Laws, "rights," "rules of civilized behavior," and war all re-

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sult from the need for individuals and various levels of societal organizations to deal with aberrations of behavior outside of what is acceptable within your definition of tolerance. They are the resources provided by the body politic to provide a "due process" standard to replace the option of personally shooting you for stepping on my toe.

ERNEST CODIER

RR2 Box 854
Clinton, NY 13323

Dear Dr. Schmidt;

First of all, I thank you for your fine magazine; it is certainly thought-provoking. Even when I don't agree with a story, fact article, or editorial, I walk away feeling like my head has been stretched.

Your editorial in the October issue gave me pause to ponder. Take, for example, an issue that I am very concerned about (although I fully realize this wasn't the main point of your editorial, it's a good illustration of some of these principles). I am a Born-Again Christian, and I believe that abortion is murder, pure and simple.

But what can I do about it?

I could go out and protest, peacefully or violently, hoot and holler, write letters, etc. All of these things have been tried by others.

None of them have worked.

Basically, I believe the direct approach is doomed to failure. We, the "conservative" Christians, have lost the cultural consensus necessary to convince people. We no longer even have the common ground necessary to talk convincingly with our opponents about the matter; we share very little points of agreement in our world-views. This means that the direct approach cannot work, since the majority is no longer automatically on our side.

We must, instead, fall back and win our culture, never forgetting that this thing called abortion is very, very wrong. But Christ called us first and foremost to preach the Gospel, to win the lost; to show His love to a continually more confused and lost generation; to the "backdoor" approach of winning by losing, of living by dying.

It won't make the evening news, but we haven't lasted for almost 2,000 years by blockading every popular sin that came along. St. Paul never threw himself in front of any chariots to stop Roman atrocities (which were many and nasty). Then again, Christians have never exactly kept their mouths shut about them, either.

So, in a large part, I agree with you. A minority cannot coerce the majority to their way of thinking for very long.

Groups usually only start to coerce when they lose the ability to convince. God help us, that we have lost our credibility by the lives we have led, and now try to regain lost ground by outshouting our opponents.

PETE KOZIA

Baltimore, MD

Dear Dr. Schmidt:

Your argument in the editorial "The Limits of Tolerance," (October, 1989) is nicely laid and cleverly supported in your conclusion. After finishing it, I took a moment to digest your thoughts and found some nagging wrinkles in the conceptual fabric that you threw over the framework of civilized tolerance.

To begin, tolerance, in the pure theoretical form, is not for the direct consumption of the general population. At the level where it can be examined rationally, it is a meaningless abstraction for the mass of humanity.

In the scientific venue, theory and application reside on opposite poles of

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a process. Both are parts of the same system, but there is a definite direction to the progression from theory toward application. The process of translation can be rapid, slow, or, in some cases, never completed. However, only when the translation of theory to useful form is accomplished can it be utilized.

The same argument holds in translating social theory into application, except that the process is a lot slipperier and the product often resembles packaged smoke. I find little evidence that the general population in the United States is mentally or emotionally prepared to rationally and logically deal with the concept of spontaneous tolerance for any social concept. The population can deal with concepts only after functional guides to understanding have been developed. The guides can take a number of forms. A few of these are called: mores, legend, myth, superstition, laws, custom, agreements, contracts; some are fast acting, others are not. They can be applied by a lengthy array of techniques, such as: direct application of pain, the threat of pain, mental anguish, the threat of mental anguish, studied indoctrination, to list a few.

To my mind, your editorial strikes at the application end of the process, but resorts to reason and logic to argue the case. Tolerance, as you point out, cannot be applied to any individual (or population) by clever arguments intended to logically convince the average individual (or segment of the population) that a change of mind is necessary. A government can shape a set of rules for a society to follow that will produce a measure of toleration. However, when rules are used to produce a change in social attitudes, a discussion of the social theory is unrelated to the matter of enforcing the rules. As a by-product, the way social rules are enforced determines the form of government a sovereign entity has—totalitarianism, republicanism, anarchism, and many shades and varieties of these basic forms.

Religious beliefs, and the hierarchy that accompanies the beliefs, often transcends other social systems and national boundaries. In order to develop and sustain the necessary level of desire and dedication in portions of the general population for this super-national religious social structure, special techniques must be employed to achieve an effective level of adherence. This produces a threat to nationalism, and is one of the causes for intolerance. The duality of allegiance also generates unsettling tension in the general population solicited to subscribe to religious and political systems that often contain conflicting rules.

Describing the intricate concepts and ideas involved in promoting toleration of religious beliefs to the general population is a waste of effort. Developing a set of rules for the population to follow is easier. Getting a set of rules for tolerance developed in the United States, where causes rise or fall on the strength of a slogan, a well-turned phrase or the sheer mass of people that run into the streets to scream and chant mindlessly, is remote tending toward none.

Once reason and logic were held in high esteem in this land, and studied as the paths to wisdom. Times change and the unsupported middle is in ascendance.

TOM DAVIS

Chula Vista, CA

Dear Dr. Schmidt:

The quotation from Petronius Arbiter (October, p. 137) was entertaining, but I suspect someone is putting you on.

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Petronius Arbiter was a friend of the Roman emperor, Nero, who committed suicide, A.D. 66, when accused of conspiracy. Nero had made Petronius the court arbiter of taste—hence, his nickname.

It's hard to believe that a man who died in A.D. 66 was writing perceptive comments in 210 B.C. At a very early age, to say the least! Nor have I yet found the quotation in the Loeb edition of Petronius. Would John Hradsky let us all know where it can be found?

DON ETZ

Kettering, OH

■

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a calendar of analog upcoming events

22-24 June
CHRONOCLASM (British SF conference) at Pennine Hotel, Derby, England. Special Guest—Mary Gentle. Registration—£8 attending, £3 supporting. Info: Chronoclasm, 24 Peartree Road, Enfield, Middlesex, EN1 3DG, England, UK.

28 June-1 July
Science Fiction Research Association XXI (SF academic conference) at Hyatt Edgewater Hotel, Long Beach, Calif. Theme—SF in the Future: There and Back Again with SFRA XXI. Registration—$80 until 14 June, $85 thereafter. Registration includes conference trip and banquet. Info: Christine and Peter Lowentrout, SFRA XXI Conference Co-Directors, 1017 Seal Way, Seal Beach CA 90740.

28 June-1 July
ORIGINS/DRAGON CON '90 (Atlanta SF conference) at the Atlanta Hilton and Towers, Atlanta, Ga. Guests of Honor—Tom Clancy and Doug Niles. Info: Origins '90, Box 47696, Atlanta GA 30362. Include SASE.

5-8 July
WESTERCON 43 (Western North American SF conference) at the Red Lion Jantzen Beach Center, Portland, Ore. Guests of Honor—Ursula K. LeGuin, Vonda N. McIntyre, Kate Wilhelm; Fan Guest of Honor—Art Widner; TM—Steve Perry. Registration—$40 until 20 June 1990, $50 at the door; supporting—$15. Info: Westercon 43, Box 5794, Portland OR 97228. (503) 283-0802.

20-22 July
GAYLAXICON '90 (SF & Fsy conference for gay people and their friends) at Andover/Tewksbury Holiday Inn, Tewksbury, Mass. Guest of Honor—Melissa Scott, Art Guest of Honor—Hannah Shapero. Registration—$15 in advance. Info: Gaylaxicon '90, Box 1051, Back Bay Annex, Boston MA 02117. Attendees under 18 must be accompanied by parent or guardian.

23-27 August
CONFICTION (48th World Science Fiction Convention) at Netherlands Congress Centre, The Hague, Netherlands. Guests of Honor—Joe Haldeman, Wolfgang Jeschke, Harry Harrison; Fan Guest of Honor—Andy Porter. Registration—$85 until 15 July 1990. Supporting—$28 until 15 July 1990. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Join now and get to nominate and vote for the Hugo Awards and the John W. Campbell Award for Best New Writer. Info: Worldcon 1990, Box 95370, 2509 CJ The Hague, Netherlands. Enclose sufficient International Reply Coupons for airmail response.

30 August-3 September
CONDIEGO/NASFiC (North American SF Convention) at the San Diego Omni Hotel International, San Diego, Calif. Guest of Honor—Samuel R. Delany, Fan Guest of Honor—Ben Yalow. Registration—$65 until 1 January 1990, $75 thereafter, $85 at the door. Supporting membership—$25. Info: ConDiego, Box 15771, San Diego CA 92115.

—Anthony Lewis

Items for the Calendar should be sent to the Editorial Offices six months in advance of the event.

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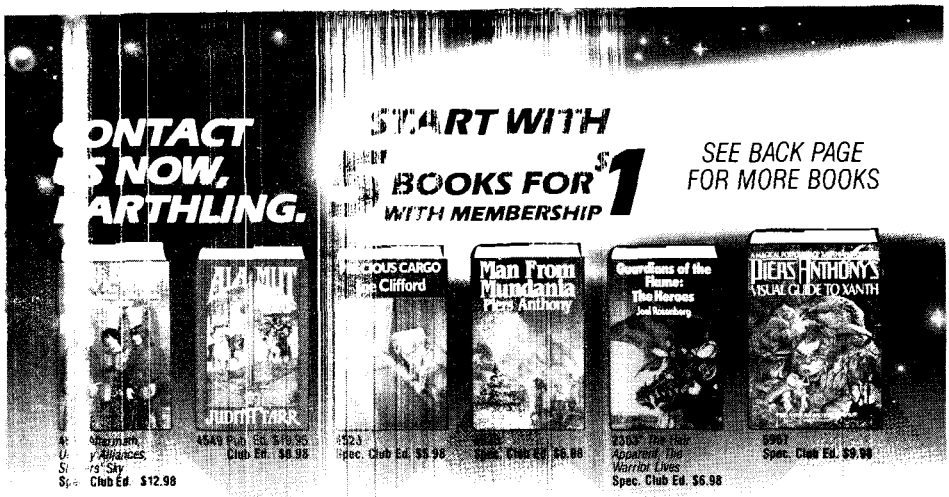

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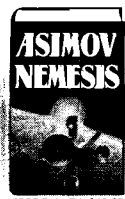

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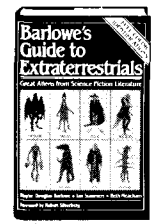

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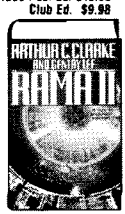

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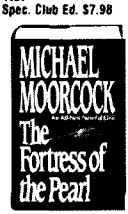

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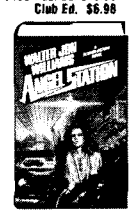

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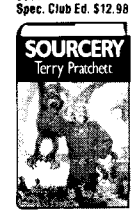

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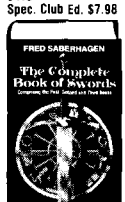

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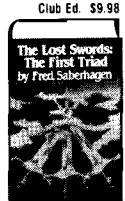

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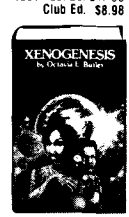

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